Virtuous Worlds

The Natural Science of Purpose

A.J. Marr

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Preface

This is a book without a purpose, or more to the point makes the argument that there should be no purpose. Purpose is something our social, religious, or political institutions assign to us. We agree to it for the most part unwittingly and follow our own individual goals within the guardrails of what others think is fitting and true. Such are the folkways and mores of society, that tell us where to place our knife and fork and which way to turn at the moral forks in the road which determine human value, all the while muting the natural impulses which without law would set us astray. But is human nature so irredeemable that it requires an imposed societal or supernatural law that bestows upon us a compelling rather than impelling purpose?

In our modern age, we know that life and consciousness are emergent properties from the basic atoms of existence. The question is, does value follow, and does it emerge as naturally from the elemental facts of incentive? In this book we will trace this search for the explanation of purpose, or teleology from the ancient Greeks to modern philosophy and the neuroscience of motivation and demonstrate that the natural science of incentive or purpose leads irrevocably to selfish but virtuous worlds, and that our future Utopias to be there but nowhere require no purpose at all.

Introduction

Under the reign of the Roman Emperor Theodosius during the late Roman Empire, the books were burned. It was a selective destruction of knowledge, a purposeful act for those ideas that literally had no purpose. It was an assault on a specific set of ideas of Hellenic origin, predating to the time of Alexander the Great, when natural law was a matter of great to middling purpose, but a fixed purpose nonetheless. Purpose was certain and obvious, and like weight and measures, was denominated in the laws of men and God.

Unless perhaps there was no currency to begin with, and mankind had to start out as when it was born, naked and bankrupt, with the only certainly that he knew nothing. According to this contrarian perspective, honed and explored by one-man, natural law was not set by the gods or men but derived from the elemental nature of the world. Those ideas came from a peer in time and place to the philosopher Aristotle who shared the extent of the latter's catholic interest in the whole of knowledge. Like Aristotle, he wrote about every topic, from the movement of the stars to the movements of minds. A stupendous compendium of knowledge that was regarded as equal to any in the ancient world. From its method and aim, all began as atoms and void, and from there came all the marvels of the world. A recipe for science but not for dogma, as uncertainty is the spur to science, and a bane to religion and the body politic. That makes value

uncertain in an uncertain world, a dangerous idea and recipe for chaos.

And for this, his books were burned.

As science teaches us, the workings of the world come from deriving reality from the essentials of existence. From Newtonian mechanics to Darwinian natural selection to the genetic and quantum codes, the world emerges and can be computed from the basic atoms that comprise our world. The question is, when transitioning from the hard sciences to the social sciences, can elemental properties of life and motivation be used to predict how human purpose emerges, and what forms can and should take shape? Or is this not necessary or even possible, and purpose should be derived from final causes, whether it be selfless redemption of selfish power.
This latter position represents the concept of teleology, as philosophy defines it, incentive motivation, as psychology defines it, or meaning or purpose, as common discourse defines it. It has been the preeminent topic in all social sciences from the abstractions of philosophy to the simple dictums of common sense. Yet up to now, purpose as a human trait has been largely inferred, with little or no regard for the neurological facts from which it emerges. Here we will derive a new concept of purpose as not an imposed but as an emergent property from the simplest of instincts that merely provides for survival. From the most modest of creatures to the wisest of

mankind, we will demonstrate how all-purpose emerges from the basic atoms of existence.

In this book we will start with our neglected and ostracized philosopher and trace the development of teleology from rhetorical discourse to the neural tracings in the mind. And with all good stories, it will have a winding path and a happy ending, if we choose it, and redeem the life and reputation of a wise philosopher whose books were burned.

Chapter 1

The Laughing Philosopher

Heredity is destiny, but it may be better to argue that the most delicate flower requires a hot house to survive. Certainly, classical Greece (ca.500-300 BC) met the metaphor, as genius was not an isolate, and flowered in abundance upon its stony and confining isles, mountains, and shores. We are shaped by our decisions, but nonetheless fit the contours of the potter's mold, and are guided as much by our environment as genius. But what are the circumstances that shape genius, and in particular the genius of a people? It can be said that the classical Greeks were informed by no purpose save their own industry and curiosity, which were channeled for no other political or religious purpose save for survival. The politics at the time were fractured among more than twelve hundred city states that were little nations into themselves with their own laws and customs, united only by a common language and culture, and lorded over by lackadaisical gods who made their pleasure and displeasure by endless commotion of the elements, from passing of the moon and sun to the turn of the seasons. It was as if the twelve hundred municipalities in the state of Texas were given absolute freedom for individual governments, making for endless competition, conflict, and strife, with some cities focusing on trade, some on farming, some on

philosophy and the arts, and some on war. And so was founded not the nation but the identity of Greece. The Grecian city state or polis spanned mainland Greece and its islands to the shores of the Black, Adriatic and Aegean seas, isolated and formed by maritime channels and mountain peaks, with each player on his well-defined spot, like chess pieces on a checkered board. It made for movements that were well defined, and to brighter minds, well calculated.

And so, the Greeks calculated. Using the cold abstractions of mathematics or the cold-blooded calculations of political schemes they prospered, and if one had the wherewithal to stand and think about it, there was no telling of the many patterns nature could weave, from the movements of the world to the motives of men. Into this abstract arc of time and circumstance one man had the fortune, both mental and personal, to just observe and relate what he would see.

If one encapsulated his philosophy as 'keep it simple, stupid!', he would have likely laughed, as befitted his thinking entirely. To him, simplicity was the beginning and the end of life, and complex humans are only a momentary oscillation in time and space, like a passing wave in the ocean. He kept nature simple by beginning from the premise that nature starts out simply as well. His philosophy of the natural world and the nature of man started not with a purpose in mind, but in the mere comingling of the most elementary aspects of existence, atoms. This was a revolutionary way of looking at the world that was so guided by the larger

objects of existence but made life simpler in explanation and just plain living, and this suited our philosopher just fine, and who took life with a smile.
His name was Democritus, a handy name that was absent of honorifics or ancestry, so even his name was devoid of inherent purpose. A professor Democritus or a Robert Democritus Jr. would have been absurd in these times, as there was no accounting for genealogy or stature in times where knowledge was fleeting and scarcely recordable. According to the philosopher Aristotle who followed him by a generation, Democritus was born in Abdera, on the coast of Thrace, near modern Greece. Democritus had the good fortune to have a good fortune, a large inheritance left to him that enabled him to travel throughout the known and not so known world, where he understood to satisfy his extraordinary thirst for knowledge. He travelled over a great part of Asia, and, as some state, he even reached India and Ethiopia We know that he wrote on Babylon and the land of Kush in the upper Nile; and was rumored to have live in Egypt for several years. He himself declared, that among his contemporaries none had made greater journeys, seen more countries, and made the acquaintance of more men distinguished in every kind of science than himself.

Democritus

It was his desire to acquire an extensive knowledge of nature that led him into distant countries at a time bereft of travelogues and libraries when travelling was the principal means of acquiring an intellectual and scientific culture; and after returning to Greece, he occupied himself only with philosophical investigations, especially such as related to natural history. To Democritus, the purest joy and the truest happiness are only the fruit of the higher mental activity exerted in the endeavor to understand the nature of things, of the peace of mind arising from good actions, and of a clear conscience.

Democritus was well traveled and well-read considering what was readable at the time, and on

friendly or speaking terms with Hippocrates, the founder of modern medicine, and perhaps even Socrates and Plato, although the latter mentions Democritus in none of his writings. His curiosity spanned the breadth of knowledge, and he explored and wrote books on all subjects, producing nearly eighty treatises on subjects such as poetry, harmony, military tactics, and Babylonian theology, all now lost to the ages save for fragments and the accounting of his peers, including the philosopher Aristotle His works were destroyed not by ignorance or happenstance, but on purpose, ironically because they vouched for no purpose. So, what are we left with? A fragmentary knowledge, mainly from the citations of his contemporaries and from classical scholars before the fall of Rome.

Democritus was not above noting nature's ironies, which humored mankind by giving him a fleeting existence, with the inevitable end an oblivion to the race and its posterity. Whereas his peers, through philosophy or superstition, vouchsafed their accomplishment and spirits to a higher place, an Elysium so to speak, Democritus saw mankind simply returning to a more primal stuff, and considering the pretentiousness of mankind, could only smile at an irony only he could perceive.

In the approximal age of classical Greece, from 500-300 B. C., intelligence was privileged by patronage, circumstance, and wealth. Democritus was favored by all these things, as he was respected widely by popular acclaim by rivals such as Aristotle. It was Democritus

who, in his numerous writings, carried out by his mentor Leucippus's theory of atoms, and especially in his observations on nature. These atomists undertook the task of proving that the quantitative relations of matter were its original characteristics, and that its qualitative relations were something emergent, with matter and mind deriving from the basic stuff of existence rather than at the behest of a higher intellectual or God like power. All well and good for Democritus and his school, except for the fact that he was telling nature's tale with no happy ending or any ending for that matter in sight.

No one was more aware of this than his academic peer, the philosopher Aristotle. Aristotle understood Democritus rightly in this respect as he generally valued him highly, and often says of him, that he had thought on all subjects, searched after the first causes of phenomena, and endeavored to find definitions The only thing for which he censures him is a disregard for teleological relations, and the want of a comprehensive system of induction. But that it may be added, was entirely the point, as the astute reader may deduce.

Aristotle's embrace of induction, or the position that correlations prove the rule (or specific observations lead to general truths), was entirely at odds with Democritus' deductive method that explanations prove the rule (or general observations lead to specific truths). Inductive reasoning almost always deals with probable statements, as correlations may likely prove true, but to that there is no guarantee. For example, to proceed from the personal observation of white swans

that all swans must be white may be true, but there is no factual knowledge of how white swans came about. In other words, induction discovers, but deduction confirms, making deduction certain if premises are true, as induction only offers likelihood.

Deductive reasoning on the other hand deals with conclusions that are guaranteed to be true if their premises are true, and to make sure of this for all phenomena large and small, Democritus started with the most basic premise of them all, the indivisible atom. He held that originally the universe was composed of nothing but tiny atoms churning in chaos, until they collided together to weave into large objects including the earth and all its flora and fauna. He surmised that there are many worlds besides the earth, some growing, some decaying; some with no sun or moon, some with several. He held that every world has a beginning and an end and that a world could be destroyed by collision with another world. Democritus concluded that divisibility of matter comes to an end, and the smallest possible fragments must be bodies with sizes and shapes, although the exact argument for this conclusion of his is not known. The smallest and indivisible bodies he called "atoms". All of this of course was confirmed more than thousand years after his passing.

Democritus' thought was amazingly prescient and foreshadowed the aim and methods of science. Following Democritus, science is agnostic about purpose, preferring detailed observation, deduction, and proof that make sure of the workings of the world.

Humans however are impatient about rooting out nature's purpose, and while science could wait, dogma would find a way. To unlettered minds, science is always seconded to the prejudice of the wholly inferred aims to the world as inductively perceived. From the general to the particular was the guiding principle that envisioned the stars guided by invisible hand, and nature taking its course to meet its purposeful ends. On the other hand, the deductive methods that build worlds from the particulars of nature required intellectual discipline and patience, a patience that would span generations in ages enlightened and dark.

For the progress of science, Democritus has reigned supreme, and all the physical and biological sciences proceed from first principles, from atoms to elements and from DNA to genes. Indeed, the metaphors we use to think of and calculate the world reflect these atomistic principles of working your way from the bottom up, except for philosophy, which remains untethered to the basic facts of the neuro-biology of incentive or purpose, as if the minds and motives of man have emerged unmoored from such rudiments, and can be explained top down, if you please, with a preferred motive for a every behavior that is guided and tempered by societal or divine hands that have purposes all their own.

And this brings us back in the chapters to come to the purpose of life, existence, and the future of all thinking things in a universe of ever enfolding atoms. And for its result? Let us say that Democritus would only smile.

Chapter 2

Telos

In the beginning, God created the heaven and the earth. And the earth was without form, and void; and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters.
And God said, let there be light: and there was light.
-The Book of Genesis

"If, in some cataclysm, all scientific knowledge were to be destroyed, and only one sentence passed on to the next generation of creatures, what statement would contain the most information in the fewest words? I believe it is the atomic hypothesis that all things are made of atoms — little particles that move around in perpetual motion, attracting each other when they are a little distance apart, but repelling upon being squeezed into one another. In that one sentence, you will see, there is an enormous amount of information about the world, if just a little imagination and thinking are applied."-Richard Feynman

What's it all about? What is God's purpose, nature's purpose, our purpose? It may be argued that philosophy began as a Greek sensibility that had a head start in human curiosity, and it all began with this question. Prior to the times of classical Greece, the answer to this question was simple. Philosophy was rudimentary and predictable, and accordingly, a topic to be easily considered. Life, value, and the ways of the

world were all fixed, and all had their set purpose under the sun. Everything was explained from the purpose it served, from the meanderings of a stream to the motions of a star. Unfortunately, fixing purpose foreclosed on postulating causes, with the consequent focus on justifying ends. So, the world existed to satisfy the whims of gods, sprites, and spirits, and there was no mechanism, no explanation, and no emergent meaning. Better in other words not to question the gods and accept things the way they are, which to almost all of humanity was just fine. And so, the Universe begins with a purpose for nature and for man set by God, rather than a nature and purpose emerging over the eons from the evolving dance of little particles. An intelligent designer is reassuring to an anxious race, while an emergent design is far less so. Better perhaps to endorse the deus ex machina, a mechanical god from the clouds rather than a mere mindless machine that would be more prone to catapult you into oblivion rather than to heaven's gate. But perhaps it is not that simple for questioning human minds, as for the design and purposes of human nature and the nature of our physical and biological worlds, teleology has remained a predominant and enduring topic for philosophy. For human nature in particular, an intrinsic purpose of some sort remains unquestioned, and we continue to determine purpose by its ends, or its utility to us, whether it is dictated by ourselves, our family, our society, or a personal deity. The course we take from moment to moment is determined by this personalized gravity, or how our

behavior is attracted to purposeful or determined ends that morph from one form to another like quicksilver. So, purpose in life may be to be one with nature, or to simply cross and control it, and for personal ends that may be selfish, self-less, dedicated to the common weal, or to its conquest and control or for the glory or fear of God. Purpose is the axis upon which philosophy turns, and the great arguments in human thought from east to west pivot upon the ends of the world and of individual life which is not clearly vouchsafed by an uncaring universe.

In the present day, the purpose or teleology of humans and humanity remains subject to the ever-weaving knot of the philosophy of scholars or public opinion. This is in stark comparison to the teleology of our mammalian cousins, which has followed an un-winded and singular path, though one less palatable to the tender sentiments of our present day. In contrast to the convoluted goals of humanity, the purpose or goals of our mammalian cousins revolve about far simpler ends. Animals remain aimless wanderers without a purpose bestowed by nature save for a will to survive predicated by the need to predict what is around the corner. Nature by tooth and claw is evolution's hammer and anvil, so rudely applied in the natural history of life and the bloody history of mankind, a future that we may rebel against in act and justify in philosophy. We will return to this evolutionary narrative a bit later, but for now let us account albeit simply for how philosophy has described purpose from ancient times to the present day.

Teleology East and West

Telos is the Greek word for end, aim, or goal, or the events that direct and drive our aspirations and behavior. Telos, purpose, meaning or incentive are the governing metaphors that are assigned by God, nature, society, or our individual volition.

These metaphors are archetypes for certain *types* of thinking that have demarcated philosophy to this day. In short, while science answers how, teleology answers why, and the '*why*' as we shall see can be completely untethered and uninfluenced by the '*how*', leaving science, which can add a corrective to purpose, out in the cold. Teleology is a reigning concept in western philosophy, and thinking about purpose is a common thread in all thought from east to west and from academic to commoner.

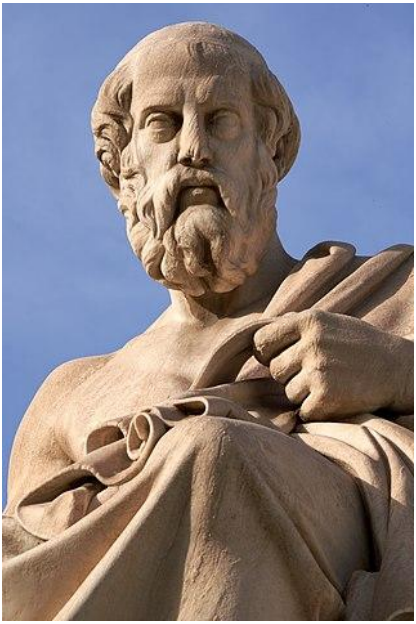
Teleology describes phenomena in terms of the purposes they serve rather than of the causes from which they arise, and as such purpose is purely inferential and is not rooted to specific underlying and real events or causes. Yet, causes are complex, hard to determine, and given human nature, endlessly debatable. Purpose however can be as fixed as a star, and is simple, obvious, causeless, and in principle, agreeable among followers of religious sects, societal traditions, and philosophical schools. Humans prefer teleological ways of thinking and the inductive principles that follow it, as divining of deducing the true explanation of all things is a matter for other thinkers and ultimately the Divine, but even here God

may have different things in store, depending upon whether you are reasoning from east or west.
While western teleology often focuses on final causes that impel behavior from a proverbial distance, eastern thought often focuses on finding peace through the surrender of striving and aligning with the present, rather than achieving a future end. Teleology in Eastern philosophical tradition generally emphasizes immanent, unfolding purpose within nature, contrasting with Western notions of external design. Thus, Taoism focuses on spontaneous flow (Ziran) rather than fixed goals, while Buddhism views life's purpose as overcoming attachment to achieve nirvana, and Confucianism emphasizes cultivating virtue to harmonize society. As for Hinduism, life's purpose is defined by Dharma (duty) and Moksha (liberation), which is the ultimate goal of reuniting the individual soul (Atman) with the ultimate reality (Brahman). In essence, teleology in Eastern philosophy is not about finding a fixed purpose, but rather about aligning oneself with a path of self-realization and harmonious existence within the larger cosmic framework. It is not resolute in purpose, but dissolute in being, as consciousness does not escalate but merely evaporates. Eastern teleological conceptions lose the driving force behind the concept, like visualizing a train without a locomotive, and it may be argued they are not teleological at all because they deny purpose. Indeed, teleological ideas provide the metaphorical beacon and driving force for behavior from animate to inanimate objects to get along in the courses dictated by gods,

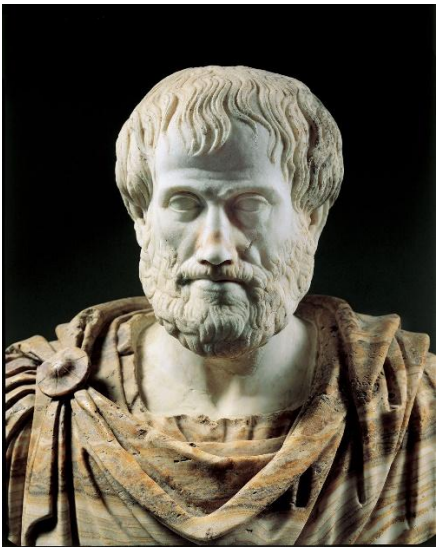
nature, or man. So not only as a philosophical but as a *practical* matter, teleology lets us know not just where and why we are going and not only directs but justifies behavior. So, we are not good just for goodness's sake, but because of end points of redemption, justification and survival.

In western thought, the discussion about the important role of teleology has ancient origins. It is particularly prominent in Plato's depiction of the divine creator of the world 'Demiurge' in the *Timaeus* and Aristotle's discussion of final causes in the *Physics*. However, Plato's and Aristotle's understanding of teleology, as well as their arguments for teleology in the natural world, are distinct. For the Platonic view, the Demiurge is a benevolent shaper through not the creator of the world, and it the source of all motion in both the heavens and on earth, and the universe and all living beings within it are artifacts modeled on the Forms. The goal toward which all things, including living beings, are directed is the external and eternal good of the Forms. To Plato, Forms are the abstract, immutable, and perfect blueprints or essences—such as justice, beauty, or circularity—that exist in a transcendent, non-physical realm, acting as the true, objective reality behind the imperfect, changing world of physical objects. Plato's viewpoint is idealistic as compared to Aristotle's realistic view of the cosmos. Whereas Plato's teleology is anthropocentric and creationist, Aristotle's is naturalistic and functional. In the Aristotelian view, the teleology that directs the behavior of living beings is immanent or 'operating

within'. For instance, in organismal development, the impetus for this goal-directed process is a principle of change within the organism, and the telos, or goal, of the development is also an inherent property, like the inherent nature of an acorn developing into a tree. Behavior is tethered from an initial to a goal state like it was riding on a clothesline, with inferential processes that keep it on track that are optionally added to keep the appearances, or why nature is staying on track even when it from time to time gets off the track. For Aristotle and Plato, purpose was either real or a placeholder for being for something hidden but no less real, but both were unified by the fact that neither provided a suitable explanation. But what is explanation? Per Wikipedia, *an explanation is a set of statements usually constructed to describe a set of facts that clarifies the causes, context, and consequences of those facts.* The problem is, if you don't have all the facts, you can't have an explanation. But you can infer purposes, or in other words if you don't know how you can always infer why, and when facts are at a premium because civilization has collapsed, purposes are perhaps all you have, and you have to trust the ancients for facts about nature that you have no time or expertise to observe or confirm.

= 

Plato

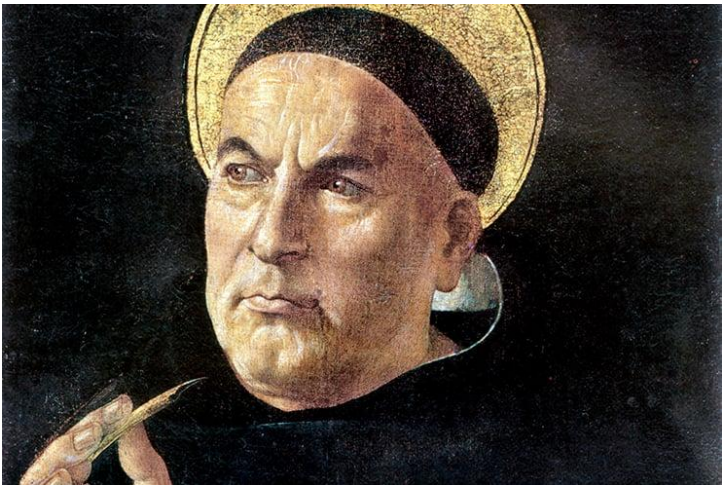


Aristotle

Thomas Aquinas

For the dark ages, and the following medieval times that preceded the dawn of the European enlightenment, times were tough all over, and faith at least promised more than the uncertainty of reason. Although Greek philosophy advocated faith in purpose, Christian scholars of the day saw purpose in faith, and for this even Aristotle stood to be corrected. A naturalistic purpose for human life was for Aristotle an equation that did not admit a creator, but in the theocratic age inserting the divinity was a matter of faith itself. Immanent design, or divinely prescribed purpose is intrinsic to all Judeo-Christian faiths, but it was the eminent Catholic scholar and philosopher Thomas Aquinas who interjected this notion into Greek thought resulting in the teleological model that underpins these faiths to this day.

According to Aquinas in his 'Summa Theologica', "*The fifth way is taken from the governance of the world. We see that things which lack knowledge, such as natural bodies, act for an end, and this is evident from their acting always, or nearly always, in the same way, so as to obtain the best result. Hence it is plain that they achieve their end, not fortuitously, but designedly. Now whatever lacks knowledge cannot move towards an end, unless it be directed by some being endowed with knowledge and intelligence as the arrow is directed by the archer. Therefore, some intelligent being exists by whom all natural things are directed to their end; and this being we call God.*"



St. Thomas Aquinas

Aquinas is representative of medieval thought which adopted and adapted Aristotle's natural teleology to align with Christian doctrine, viewing the universe's order as a direct reflection of a divine creator's plan, often called the "argument from design". It was commonly presumed that natural agents possessed inherent or immanent active powers to achieve their own specific ends, and ethical behavior gravitated to the ultimate goal or "highest good" for human beings, leading upon death to a divine reunion.

Aquinas proposed that the existence of final causes, by which a cause is directed toward an effect, can only be explained by an appeal to intelligence. However, as natural bodies aside from humans do not possess intelligence, there must exist a being that directs final

causes at every moment. That being is what we call God.

Of course, all good things, or more aptly, all godly things, have their allotted time in heaven and on earth, and earthly observation of how human bodies worked soon broke the philosophical tether between humanity and the divine. Indeed, even a cursory observation of humankind and all living things revealed not purpose, but mechanisms from which purposes were secondary or considered not at all.

In the 17th century, philosophers such as René Descartes, Francis Bacon, and Thomas Hobbes wrote in opposition to Aristotelian teleology and its medieval iterations. The suggestion that there's more to objects than their materialism was rejected in favor of a mechanistic view of even complex creatures and organisms. According to Hobbes, writing in Leviathan: *Life is but a motion of limbs. For what is the heart, but a spring; and the nerves, but so many strings; and the joints, but so many wheels, giving motion to the whole body*. Francis Bacon likewise sought to divorce the study of final causes from scientific inquiry, saying: "*The handling of final causes, mixed with the rest in physical inquiries, hath intercepted the severe and diligent inquiry of all real and physical causes, and given men the occasion to stay upon these satisfactory and specious causes, to the great arrest and prejudice of further discovery.*"

The philosopher and mathematician Rene Descartes, on the other hand, argued that whether or not final causes existed, the purposes of God in creating things were inscrutable: *"I now know that my Nature is very*

Weak and Finite, and that the Nature of God is Immense, Incomprehensible, Infinite; from hence I must fully, understand, that he can do numberless things, the Causes whereof lie hidden to Me. Upon which account only I esteem all those Causes which are Drawn from the End (viz. Final Causes) as of no use in Natural Philosophy, for I cannot without Rashness Think myself able to Discover God's."

The philosopher David Hume left the discussion with the opinion that we have an instinctual belief in the inductive belief in final causes, rooted in our own biological habits, that we cannot shake and yet cannot prove. Hume allows we can still use induction, like causation, to function if we recognize the limitations of our knowledge. That assumes of course that we have the intellectual wits, time, and temperament to criticize not only what we know but how we know, a tall order for an imperfect race. Induction is 'good enough', and it is not so much instinct as practicality that we believe the sun will always rise, despite knowing how or why. But while science was beginning to provide adequate explanations of natural phenomena, it stopped short of explaining how life develops. In the late 18th century, Immanuel Kant acknowledged this shortcoming in his Critique of Judgement: *"There will never be a Newton of the blade of grass, because human science will never be able to explain how a living being can originate from inanimate matter*."

Kant was metaphorically not on the level here, as with the introduction of modern instrumentalities that can indeed look closer, the explanation of how living things can emerge from the inanimate matter of DNA

was revealed. Still, Kant's observation has philosophical force, and in our current day although we know the mechanisms of living things, their motives remain as resistant to explanation as before, or so it seems. As we shall demonstrate, without explanation there is no science, and blades of grass can have proverbial minds of their own. But what is science, or how do we get to know nature's laws and the facts those laws animate and describe?

Chapter 3

A Matter of Science

The Rhine flows north, the Rhone south; yet both spring from the same mountain, and are also actuated, in their opposite directions, by the same principle of gravity. The different inclinations of the ground on which they run cause all the differences of their courses. - David Hume

"It is not the victory of science that distinguishes our nineteenth century, but the victory of scientific method over science."-Friedrich Nietzsche

"If you wish to converse with me, define your terms."- Voltaire

"The anatomist presents to the eye the most hideous and disagreeable objects; but his science is useful to the painter in delineating even a Venus or a Helen. While the latter employs all the richest colors of his art and gives his figures the most graceful and engaging airs; he must still carry his attention to the inward structure of the human body, the position of the muscles, the fabric of the bones, and the use and figure of every part or organ. Accuracy is, in every case, advantageous to beauty, and just reasoning to delicate sentiment. In vain would we exalt the one by depreciating the other. -David Hume

Science and Explanation

Science *is a systematic based process for studying the physical world through observation, experimentation, and testing. It builds knowledge by creating testable explanations and models to understand how nature works, Wikipedia*

Explanation *is a set of statements usually constructed to describe a set of facts that clarifies the causes, context, and consequences of those facts. It may establish rules or laws and clarifies the existing rules or laws in relation to any objects or phenomena examined. Wikipedia*

Science, or scientific thinking starts with our observation of all the facts of nature, from the molar or level of appearances from our senses to the molecular, or the world of enhanced appearances as provided by our instrumentalities. From facts we notice inductive corrections which can be used to deductively derive laws of nature that we can use to make predictions to mentally and physically shape our environment. And science begins with our personal introduction to the world.

We are born as creatures who observe and are governed by the correlations of the ever-changing facts of life. That the sun rises and sets, that all swans are white, and walking gets you from one point to another are among the myriad facts that constitute the clockwork of nature. As thinking beings, we can also deductively derive additional information from the inductive regularity of our observations and hone the

procedures that we can use to predict and control our worlds. Thus, throwing and catching a ball or seeing an apple fall can be enhanced by deductive numeric predictions or 'laws' that can unerringly predict the motions of cannonballs and moons and the mechanics of engines and motors. Similarly, by observing the symptomology of disease from onset to recovery and its changes due to various remedies, we can make general predictions about disease, its treatment, and the likely outcomes that follow.

Thus, from deriving correlations from phenomena (inductive reasoning), and then refining these generalizations through further observation and experiments (deductive reasoning), one can derive the logical principles or laws which control our world. Following its most celebrated practitioner, Isaac Newton, this approach is often described as "inductive-deductive," where inductive reasoning provides the foundational laws, and deduction allows for calculation of consequences when a controlling or 'independent' variable is changed.

Still, this approach has its limitations, as the world of appearances, or what our unenhanced senses perceive, provides incomplete information about its true foundation or cause. Therefore, we have correlations but not *explanations*, and although we can deduce additional correlations or laws, the true causes are hidden from us, and we are left to infer not only causes but purposes, or teleological thinking. Thus, diseases could be due to bad air, bad behavior, or malignant spirits, and all in service for the purpose of divine or

natural retribution. But none of this could be proven or disproven because the actual causes could not be observed before the advent of the resolving instrumentalities of modern science. To Isaac Newton, similar inferences in physics were to be avoided because he too could not look closer, and for the unknown causes of action at a distance, or gravity, Newton simply declaimed 'hypotheses non fingo', or I make no hypotheses. So how do you discover these elusive causes? As we shall see, you simply get to the bottom of things.

Wholes and Parts

When we observe or experience anything, we possess different levels of observation due to our own senses and the instrumentalities we have available that enhance our senses from microscopes to telescopes. Reducing an object to its simplest and most fundamental components is called *reductionism*, and deriving an object from these components is called *emergence*. In addition, we can simplify the description of processes at any level of observation through the language we use, like describing a cake through its recipe. It is of note that simplification is different from reductionism as it aims to improve communication by removing unnecessary details that can impede the conceptualization and computation of actual processes but does not purport to reduce those processes to subordinate parts. Thus, I can use a recipe to make a cake, but do not need to break down or reduce the

ingredients to their molecular parts, such as carbohydrates, fats, etc.

Simplification may be very broad or very precise depending upon the language (syntax) that describes or maps to real events (semantics). Thus, I may say that I am throwing a ball, and my language maps to a generalized set of behaviors such as balls and throwing. I may also use mathematical or Newtonian equations to describe 'throwing the ball' more closely, and be able to predict the direction, trajectory, and distance of the ball with precision.

However, Newtonian equations cannot solve for action at a distance, or gravity, nor can they provide a mathematical description for the very small that allows us to create the transistors, lasers, and superconductors necessary for computing and the internet. For that, you must observe lower level or sub-atomic processes to provide a lower level or quantum mechanics that can describe, codify, and be used to manipulate the world.

So where to start when you want to understand the world? As Democritus would argue, you start from the bottom, a position we may add that is quite understandable and wholly computable. The simple fact is that reductionism is not computable, but emergence *is,* and to build worlds you need to begin with the atomistic essentials. In other words, you can logically derive a frog from DNA, but not DNA from a frog. Reflecting these constraints, lower or molecular levels can error correct for higher level inferences, where higher or molar levels or the world of appearances cannot correct for lower-level inferences.

To understand why this is so, you must factor in the simple act of factoring.

Reductio ad Absurdum

Reductionism as defined infers not just the observation that there are higher and lower levels of observation, but also that there is a *process* of reducing the world of appearances, or molar events, into their constituent or molecular properties. The opposite of reductionism, or emergence, includes a similar inference that the world of appearances may be derived from a consideration of its parts. But are both directions equally derivable?

The answer is no.

Indeed, it can be easily demonstrated that emergence is easily computable, whereas reduction to molecular levels is generally not computable at all. To illustrate, consider a naïve observer who has only knowledge of the world of appearances. Take a single frame of a beautifully detailed landscape in a video game, numerically rendered as a matter of course, and from there try to deduce its source code, and he would be stuck working it out until the end of time. However, if he has the source code, he can not only predict the landscape emerging from it, but also all variations it may possibly have. This represents the problem of factoring.

To factor a number means to break it down into a product of smaller numbers (its factors) that, when multiplied together, equal the original number, essentially rewriting it as a multiplication problem, like factoring 12 into 3 × 4 or 2 × 2 × 3, where 2 and 3

are its prime factors. This process reveals the fundamental building blocks of a number, helping simplify expressions, solve equations, and understand number properties. Factoring very large numbers is computationally "hard" because no efficient classical algorithm exists. The number of potential factors grows exponentially with the number of digits, making brute-force, trial-and-error approaches take longer than the age of the universe. For the world of appearances, the number we have to factor is exponentially large, and it is nearly impossible to derive the molecular processes from which it emerges. Because of this, the postulation of large scale or molar processes are unprovable through reductionism because they cannot be practically reduced to small scale or molecular parts.

On the other hand, the logic of emergence, or deriving the large from the small, is much more tractable to logic because you are starting with a large set of uniform variables that are computable. Emergence from lower levels of observation does not reduce the number of events one must engage in, as they are as innumerable on the atomic level as there are stars in the sky. Furthermore, it does not mean that you reason from a blurry avalanche of events or variables or a highly complex series of equations. What lower or molecular events represent are facts that are similar or homogenous. So rather than talking about special origins for horses, people, and trees, on lower levels of analysis you are examining strands of DNA and other molecular structures, and on still lower levels you are

looking at a sea of near identical particles blinking in and out like quantum ghosts. So, although the number of events may soar on the microscopic level, the *types* of events are much more limited, and these limited events allow us to use a more elementary data language to construct algorithms that can be upwardly factored into the physical objects we see about us, and can be linguistically reduced to testable laws, such as quantum mechanics. In other words, lower-level observations allow us to make the world numerical, and thus computable. Thus, understanding DNA patterns can allow us to predict the external and internal contours of an animal, and understanding the mechanics of the quantum can allow us to engineer computer chips and the internet. Emergence allows us to divine the abstract properties of existence, and use them to compute the world, or an IT from the bit. But whereas we can compute the large from the small, the opposite, though mathematically possible, is near intractable because of the lack of efficient algorithms for the job. Thus, deducing gravity from Newtonian laws, the nature of DNA from a flock of sheep, or quantum mechanics from a thrown baseball is not possible.

A lower level or linguistically reductionist level of analysis merely sets the parameters for the metaphorical language that one uses to describe and manipulate the data observed that allows for the postulation of lower-level processes and their higher level or 'emergent' properties. Thus, an ignorant peasant transplanted from the 12th century could infer

any number of animistic and fantastical causes when suddenly confronted with planes, trains, and automobiles, but can understand very quickly the mechanical principles behind these objects when explained using these metaphors, or first principles, and thus be able to divine what these objects can and can't do as processes while also dismissing animistic or other fantastic causes.

A final but significant benefit of emergent level thinking is that it corrects many inferred processes by demonstrating those that cannot be derived from underlying or first principles. For example, inferred mental or physical processes from hypnosis and free will to phlogiston (actuating fire) and the ether (transmitting medium for light) should logically emerge from observation and deduction if they are indeed real. And indeed, it was because the latter could not logically emerge from lower levels of observation that led to their disproof as real processes.

Overall, science reflects the natural logic and importance of taking observed or inductive correlations and deriving their lawfulness through deduction, but what you can deduce depends upon the level of observation you use, and often only lower or closer levels of observation can provide the detailed events that demonstrate how large scale events emerge, like disease from microbial activity and gravity from the quantum granularity of space. When we isolate these causes, we thus can integrate the metaphors of different levels of analysis and observation and eliminate any need for higher end

inferred causes or ends. This metaphorical language can weave together metaphors from the large to the small that enable us not only to understand our world, but also to dismiss unwarranted inferences (evil spirits as the cause of disease, gravity represents heavy objects seeking their natural place) that add unnecessary variables to the basic calculations of life.

The triumph of science is the elimination of inferred purposes or teleological causes, replacing it with a direction for all matter and life that is emergent from the literal facts of the matter, or atoms of existence. All you need is the ability to observe these facts, from the molar or large scale to their molecular or small-scale presence. The rest is just pattern recognition, and the linguistic reduction of these patterns to the vernacular of common sense, or a mathematical shorthand of theory that makes reliable and thus testable predictions.

This redounds to our original explanation of explanation, with a metaphorical caveat. As we earlier noted, *per* Wikipedia, *"An explanation is a set of statements usually constructed to describe a set of facts that clarifies the causes, context, and consequences of those facts. It may establish rules or laws and clarifies the existing rules or laws in relation to any objects or phenomena examined*. We may add that an explanation must also be *linguistically reduceable* to make broad or fine grain predictions that not just clarify but *confirm* the causes and consequences of facts. It also must be able to consider *all* relevant facts, from the molar to the molecular. In other words, explanations generate

hypotheses that test the validity of their predictions from the simple to the complex as thus continually test validity of the explanation itself. Thus, Newtonian laws can be broadly applied to determine the behavior of orbiting moons but may even be more complexly applied to determine the behavior of multiple bodies pulling each other in space, or more commonly known as the three body or the many body problem. Similarly, the activity and rapid division of a microbe can be used to broadly predict the course of a disease but may be more complexly integrated with the activity of other systems in the body, from the immune system to shocks to the system, like a warm bath or chicken soup. In the present day, the explanatory standards of science are triumphant and are core to the success of all the biological, physical, and even psychological sciences, and provide for an ever-escalating growth in our ability to understand and predict our worlds. There is one major exception however that underscores the theme of this book, namely that the last refuge of teleology are common day philosophical and psychological formulations of human purpose or incentive that can be resolved only with a precise definition of incentive, coming no doubt from the bottom.

Chapter 4

A Basket case of Teleology's

A Matter of Liking

"I regard utility as the ultimate appeal on all ethical questions; but it must be utility in the largest sense, grounded on the permanent interests of man as a progressive being"- John Stuart Mill

We like to consider ourselves as masters of our private domain and can choose freely our courses of action in life. Yet free will has a problem, namely that it grants that purpose can be imposed on human nature by human volition or will. This means we must consider not just the purpose, but the *purposes* of life that can be created independently of life. This is a convenient truth for the profit and profitability of philosophers and pop psychologists alike, as the bestiary of human motives has exploded since the 20th century as every human has now a proverbial novel itch to scratch. Now we have needs for achievement, autonomy, power, transcendence, pleasure, freedom, affiliation, stimulation, and more, and all energized by metaphorical impulses both intrinsic and extrinsic, God like and earth bound, and exercised, like God's mind, in mysterious ways.

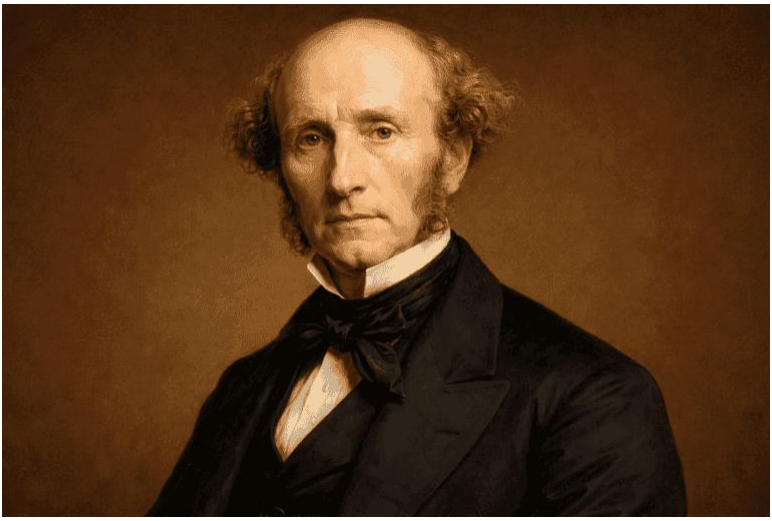
The triumph of the empiricist philosophers in the 17th and 18th centuries matured into the principles and

methods of science that we know today, wherein high-end concepts from the taste of an apple to the luminescence of a star are founded on and corrected by lower-level metaphors that describe how the world actually works. For human motivation this is not the case, or at least so far.

In the classical perspective, purpose is grounded in the inherent nature of things themselves. However, when human nature is concerned, in *consequentialism*, purpose is imposed on nature from outside by individual volition or human will. In other words, although God may play dice with the universe, for homo-sapiens we can simply load them.

The broad spectrum of consequentialist ethics, of which utilitarianism is the best-known example, focuses on the result or consequences, with such principles as John Stuart Mill's 'principle of utility', or 'the greatest good for the greatest number. But what is a good? Mill denominated goods as pleasurable events, but many consequentialists deny that all values can be reduced to any single ground, such as pleasure or desire satisfaction, so they instead adopt a pluralistic theory of value. Thus, purposes or ideals could span the values of beauty, knowledge, pleasure, love, freedom, justice, life, virtue and so on.

The problem with a malleable human will is that if purpose can be determined by simple choice, then universal or monolithic purposes can be imposed on all human natures by the choices of others, as is the case of every dictatorship, social movement, and creed founded by a single human will. In other words, if it is



John Stuart Mill

a simple matter for human nature to bend to individual choice, then it is an equally simple matter to impose purpose on those who may not know any better and can change their motivational stripes once they got religion that reflected some political, social, or religious creed. This is a recipe for ill begotten Utopias that are discordant with a human nature made falsely equivalent to individual fancies, and as history attests leads invariably to the abrogation of human freedom with the often-catastrophic degradation and depopulation of humanity.

But what if Mill's prescription was given form in a perfected world, or for any other intellectual or physical desire that was granted to us in eternal fulfillment. You could start, as the ancient poet

foretold, with the eating of a not so forbidding fruit from a lotus tree.

Lotus Eaters

"They mingled with the Lotus-eaters, who did them no hurt, but gave them the fruit of the lotus to taste. Whoever tasted of the lotus' honey-sweet fruit wished to bring tidings back no more, nor to return, but there they wished to abide with the Lotus-eating men, feeding on the lotus, forgetful of their journey home. All desire to return home – to their wives, their children, their kingdoms – vanished as if it had never existed. Their mission, their comrades still battling to get home, their ultimate goal of reaching Ithaca – all faded into insignificance, replaced by an overwhelming sense of contentment and peace. They became utterly engrossed in the present moment, lost in a languid dream where worries and anxieties ceased to exist." The Odyssey

In Homer's 'Odyssey'; Odysseus's crew landed on an island whose natives offered them the fruit of the lotus tree which caused them to forget all ambition and purpose, as the end results of desire are truly ending for all desire. Odysseus drove his men back onto their ship, demonstrating how this exemplar of the Greek mind was of a different mind of the matter, as a fulfilled purpose was a recipe for idle and purposeless languor. Better to return to the quest and its constant uncertainties, tribulation, pain, and even death, all worthy purposes in themselves when considering the alternative of a numbing stasis. The question remains,

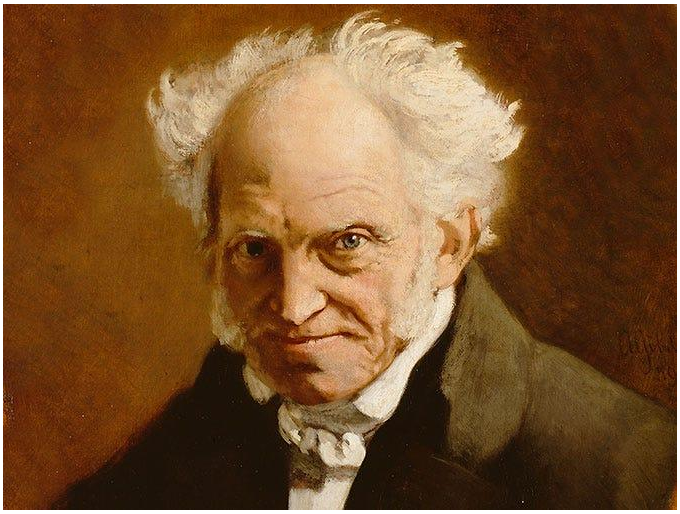
are we content to be naturally contented, and need the whip to be driven from Idyllic shores, or is there more that beckons us onward and away from idle pleasures? Utilitarian philosophy has been of great utility to many, from philosophers to pundits, as it is easy to encapsulate motivation as gravitating to some purposeful star whether its pleasures are carnal or merely intellectual. But like the proverbial dog chasing an ambulance, what do you do when you catch up to it?

Happiness is in other words, not in consequences, but in a striving that is often uncomfortable and even dangerous. Consider yourself. You are at home, comfortable, well fed, climate controlled, and have domestic pleasures abounding, but is it enough? Pleasure is a beacon to incentive; but it is *not* incentive. We can live like a king, equal and better to our regal 18th century counterparts, and even though life is much better than Louis XIV, we are still unsatisfied. All bodies, and embodied human minds, must remain in motion, and it in motion that motivation lies, with end results acting as beacons that impel only by action at a distance, or gravity, and a force that one could not realistically understand unless one could look closer. In the meantime, the answer was literally and figuratively wanting.

A Matter of Wanting

The utilitarian vision of Mill and the utilitarian philosophers of the 18th and 19th century, and its branching utilities were effective and affective in many

ways and have fractured into myriad purposes. Behavior has an aim, a driving or pulling force that fixes behavior like gravity to a star. But all aims are different, and how they emerged from lower-level processes was at the time impossible to determine from what one may ascertain was a certain lack of molecular vision. Here we shall consider two of the most influential philosophers of the 19th century who looked upon wanting very differently, from tragedy to triumph, and who are as we will argue in the chapters to come are validated by a revealed nature of things that they could intuit but scarcely plumb.



Arthur Schopenhauer

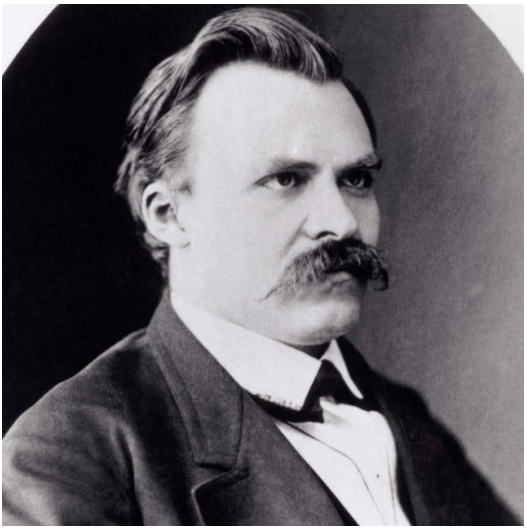
Unlike many of his predecessors, the German philosopher Arthur Schopenhauer (1788-1860) rejected the idea of an "Intelligent Designer" or a personal God, and the baggage of purposes religion foretold. His

pessimism was that nature was efficient and necessarily cruel, that nature not only abhorred a vacuum but also a vacuous and idle state. To that end, nature is movement, endless movement, and it is embodied in a state of wanting that has no purpose save for a primal, blind, and singular motive or universal will that has ‘unintelligent purposiveness’. He argued that the apparent design in nature, such as the perfect fit between a predator’s teeth and its prey, does not come from an external intellect planning things out. Schopenhauer identifies the thing-in-itself, the inner essence of everything, as ‘will’: a blind, unconscious, aimless striving devoid of knowledge, outside of space and time, and free of all multiplicity. The world as representation is, therefore, the "objectification" of the will. It is also a rejection of teleology, as there is no ‘why’, only the ‘how’ of the rudiments of human nature. Schopenhauer used the word will as a human's most familiar designation for the concept that can also be signified by other words such as desire, striving, wanting, effort and urging. Schopenhauer's philosophy holds that all nature, including man, is the expression of an insatiable will. It is through the will or wanting, the in-itself of all existence, that humans find all their suffering. Desire for more is what causes this suffering. Wanting is a thirst that cannot be quenched, and always reaches for more, including ends that perpetuate the misery and perhaps even the extinction of the race.

Schopenhauer’s remedy was simply to virtualize wanting, to put in a metaphorical bottle, where

pleasure both idealized and real could be continually sought, wanted, and renewed in memory. Boredom was the major enemy remedied by the activity of the mind alone. Its special agony was only countered by developing one's mind to find enjoyment in study and contemplation of ideas, which are self-sufficient sources of joy. Schopenhauer ultimately suggests that while a "happy life" is an illusion, a life "heroically" marked by courage and resilience in the face of suffering is the highest goal a person can achieve. This was a harsh prognosis and difficult cure for the human condition, using asceticism not to triumph over the slings and arrows of outrageous fortune, but to retreat from them. But then, perhaps ascetism was not the answer, but rather to throw oneself wholeheartedly into the maelstrom of the world, as Schopenhauer's contemporary endorsed in his own private madness.

Oftentimes the greatest psychological insights come from a vagaries of experience as rendered in literature and poetry. The playwrights Euripides and Shakespeare come to mind, and so too are philosophers of mind who set their observations to prose. Friedrich Nietzsche (1844-1900) was just such a philosopher, and it may be said that he was ahead of his time, namely a time that would verify his thought through observations grounded in reality. Nietzsche shared with Schopenhauer a foundational, pessimistic view of reality driven by an irrational, blind, and impersonal "Will". Both rejected traditional



Friedrich Nietzsche

religion and metaphysics, focusing on human suffering, valuing art as an escape, and influencing the modern understanding of the "Self". Schopenhauer argued that since desire causes suffering, the only logical response is to negate the will through detachment and a pursuit of private wisdom and the cultivation of beauty. Nietzsche viewed this as a "failure of nerve" and "life-denying". He instead proposed life-affirmation, urging individuals to say "yes" to existence despite its horrors.

The Will to Power

"*Human beings do not seek pleasure and avoid displeasure. What human beings want, whatever the smallest organism wants, is an increase of power; driven by that will they seek resistance, they need something that opposes it - displeasure,*

as an obstacle to their will to power, is therefore a normal fact; human beings do not avoid it, they are rather in continual need of it" *Friedrich Nietzsche*

Nietzsche believed that the natural human drive or impulse is to manifest power rather than self-preservation. He thought it was generally incorrect that organisms live to prolong their lifetime or extend the life of their species. Resistances are not painful annoyances but necessary for growth to occur. Suffering annoyances and being thwarted in ones attempt to accomplish a goal are necessary pre-conditions for our power. In 'Thus Spoke Zarathustra' Nietzsche said "*And life confided the secret to me: behold, it said, I am that which must always overcome itself*." Nietzsche thought it necessary to have the power to discharge one's strength and thus fulfil one's purpose in the manifestation of a will to power. "*Physiologists should think twice before positioning the drive for self-preservation as the cardinal drive of an organic being. Above all, a living thing wants to discharge its strength - life itself is will to power- self-preservation is only one of the indirect and most infrequent consequences of this*."
But is such a need for power enough? To inspire perhaps, but to truly mark change? For that answer, we must look outside ourselves.

Selves Help

While Schopenhauer and Nietzsche agree on the 'what' (the world is an irrational struggle), they disagree on the 'now what?' Schopenhauer argued that

since desire causes suffering, the only logical response is to negate the will through detachment. Nietzsche viewed this as a "failure of nerve" and "life-denying". He instead proposed life-affirmation, urging individuals to say "yes" to existence despite its horrors. Both emphasized choice by an individual, not choices guided by society, religion, or the state and how individuals must be incented to change through collective human endeavor. They emphasized the limitations and possibilities of human agency, and in their individual insistence of a cognitive way out, they laid the seeds of the self-help movement in the century to follow.

Individuals have the means to cognitively apprise their own movements and even change their calculating hopes given an inspirational pull, but only in the confines of the nurturing and at turns imposing demands of society. As a lark cannot exist and thrive without an accompanying ecosystem that both nourishes and demands constant change, so too can one resist only so much the slings and arrows of outrageous fortune while maintaining good spirits or even animal spirits. Whether you advance in the world or retreat into yourself depends upon the winding shores of overlooking opportunity and demand. When the horizons are barren or threatening, as on a deserted isle, then one must accept Schopenhauer's dire estimate of the race and recognize that brilliance is a mere ember in dark forest of banality and suffering. Indeed, would a Democritus or Aristotle thrive in a world of privation that denies sustenance for not just

survival but the survival of new ideas? This is Schopenhauer's dark reality that negates Nietzsche's ideal, but the latter revives when the sun rises and hope blooms anew, not just for individuals but to the societies that nurture them.

Limitations

Hopeful societies, in the materialistic sense as least, are founded on the knowledge of scientific principles that emerge from the basic facts of existence. Without that knowledge and the material goods it has provided, then life would indeed be continually nasty, brutish, and short. But of course, if happiness was denominated in GDP, then happiness would be assured, which it is not. In this sense, Schopenhauer is correct, and we find ourselves on a continuous satisfaction treadmill where enough is never enough. Describing this need as undefined feeling of wanting or quest for power does not have predictive power, nor does it denote true understanding. For that we need to look deeper. Indeed, the problem for Schopenhauer and Nietzsche is that their syntactical use of 'will, drive, power, and resistances' has unclear meaning or semantics. Whereas present day physical and biological concepts from force to disease are tethered to and emerge from a lower level or granular reality and greater simplicity from quantum physics to Pasteur's germ theory, both philosophers had no such biological correlate to their insights, and despite their sympathies to the importance of scientific knowledge

could not explain the underlying realities behind their metaphysical postulates of will.

As we shall see in the chapters to follow, this had more to do with the lack of the resolving powers of the instrumentalities that can observe motivational processes at the neurological level, and are only now available to modern science, and which we will later argue in many ways vindicate Schopenhauer and Nietzsche, as Einstein vindicated Democritus more than two thousand years later when in one of his cardinal papers that set his reputation he calculated the size of the atom.

We are left with the force of opinion or of science. The former is unfalsifiable, scarcely generalizable, and theoretically shallow, while the latter can be refuted in experiment and practice, and can cover all reality and readily emerges from its depths. In sum, a philosophy ungrounded has no more import than Aristotle's natural philosophy, valuable for debate but scarcely useful in practice. Ultimately, before we have the means to have mankind measure up, we must first be able to take the measure of man. And to do that, we must start with the lessons learned from far more rudimentary minds and the simple ways their own motivations developed.

Chapter 5

The Teleology of the Species

"The Truth is in the Depths" -Democritus

"Brains tend to optimize on the basis of what they already have, to add only what is necessary. Over the course of evolution, newer parts of the brain have built on, take input from, and used older parts of the brain. Is it really plausible that the brain would build a whole new system to duplicate what is could use already?….It is only from a conservative philosophical position that one would want to believe in the old faculty psychology—in the idea that the human mind has nothing about it that animals share, that reason has nothing about it that smells of the body." [i] *George Lakoff and Mark Johnson*

The Suicide of the Fittest

As humans possess language, and the ability to frame every aspect of reality with different conceptual metaphors, it may be of value to understand the reality perceived by creatures not so gifted with language, but with the same innate ability of instinct and learning, and how they virtually perceive and act upon the world.

For Charles Darwin, the teleology of the species was simple. In his classic treatise on natural selection, the 'Origin of the Species,' posited an organism's teleology

on merely the survival or it and its progeny, thus sustaining and advancing the genetic variations that ensured the longevity of the species.

So, the question is, what is survival?

For that answer, let us analogically proceed from an inanimate object with rudimentary intelligence to biological objects with a little bit more. Consider an automated starship on course from earth to the star Alpha Centauri. Its purpose, or teleology, is simple, to reach the star. Its moment-to-moment purpose, however, is survival, and here it is rendering the uncertain certain, or achieving a tenuous predictability that must be renewed continuously. From avoiding asteroids and radiation belts to harvesting interstellar hydrogen for fuel and keeping its direction keen, it is continuously seeking to maintain a tenuous certainty in its travels, and in its simple robotic mind is bound to the reality of its environment. It is simple, mechanical, and given its rudimentary purpose, and is unaware of its place in the universe.

Now consider a lion on the Serengeti plain in Africa. Its teleology or purpose is also simple, to procreate and extend its genetic line. Its moment-to-moment purpose, like our spaceship, is also survival, and it must continually render predictable its uncertain environment by scouting the environment for food, potential mates and rivals, and places for shelter and safety. It is also, in its simple mammalian mind, bound to the present and near present reality of its world. However, the lion is no unfeeling automaton, and its approach is guided by an affective sense or 'wanting'

that guides its movement like a beacon. Wanting, or a feeling of alert arousal, brightens and dims from moment to moment as the lion encounters novel positive and negative feedback to its progress. And brightens still as it approaches its prey and as its hunger grows. This feeling is critical to its motivation and its subsequent learning from experience, and allows the animal to respond quickly, accurately, and is a functional element of its consciousness.

But what if our lion had the ability to virtualize or imagine what-if scenarios that involve all the possibilities of what lay over the next hill and their implications now and in the far future and act accordingly. Its behavior would at times seem bizarre, as its momentary decisions are now geared not only to address reality, but virtual reality of a host of imagined variations which may or may not be true and may or may not lead to the best interests and hence survival of the individual and its progeny. It will cease being a lion as its behavior becomes affected by unreality and will act all too *human*. It can model realities and think about different action scenarios and outcomes including the feelings behind the chase itself. Its reality in other words would not match the virtual reality behind its motivation. This creates an opportunity to solve problems faster, better, and coherently, much to its consequent success and even madness. To understand this, consider this mind experiment.

A lion sees an antelope in the distance and is moved to approach the antelope as a goal that is virtually and realistically attainable. Now consider the more

motivating opportunity to approach the antelope and its herd. Here again, the goal of approaching the antelopes is also virtually and realistically attainable as a source of food now and in the many weeks to come. Now consider the lion approaching the antelope and the boundless herds around it and in the distance. Here the lion's goals would be virtual but unrealistic, as it has no realistic means of consuming endless antelopes. Nonetheless, it would still opt for the third alternative because its goals are approached not just effectively but *affectively*, and it is here reason mismatches affect or 'feelings', and if pursuing the third alternative at great risk is chosen compared to the easier choices, it risks destroying its own reality by an emotive dream. Happily, the lion is saved from this fate by the fact that although it has the wits for it, it doesn't quite have the brains for it. To this end, we meet the animal that does, us.

As mankind evolved from earlier hominids, its larger neo-cortex developed while its other anciently evolved or 'reptilian' brain remained unchanged. To think practically means exploring worlds virtually without having to literally bump one's head on the unknown, a great evolutionary advantage, but disadvantage too if all you know and regard are virtual things. Thus, by virtualizing worlds one can make better refuges in reality and also better refuges *from* reality. Reality in situ, or in the flesh is fleeting, but its virtual reward is in anticipation and memory, and is here affect and how it directs behavior, or motivation, arises. But where does this leave our Darwinian model? Well, it leaves

Darwin like Aristotle, resorting to teleology, when at the time he could not see closer, and imposing purpose of natural selection as a proxy for the emergent processes that virtually cast survival aside. Thus, "*at the time Darwin proposed his theory of evolution there was no concept of intrinsic factors which could evolve, he postulated a process of extrinsic effects--natural selection. Biological order was thus seen as an imposed, rather than an emergent, property. Evolutionary change was seen as being determined by the functional efficiency (adaptedness) of the organism in its environment, rather than by spontaneous changes in intrinsically generated organizing factors. The initial incompleteness of Darwin's explanatory model, and the axiomatization of its postulates in neo-Darwinism, has resulted in a theory of functionalism. As such, it introduces an unnecessary teleology which confounds evolutionary studies and reduces the usefulness of the theory. RT O'Grady*

The Superfluous Man

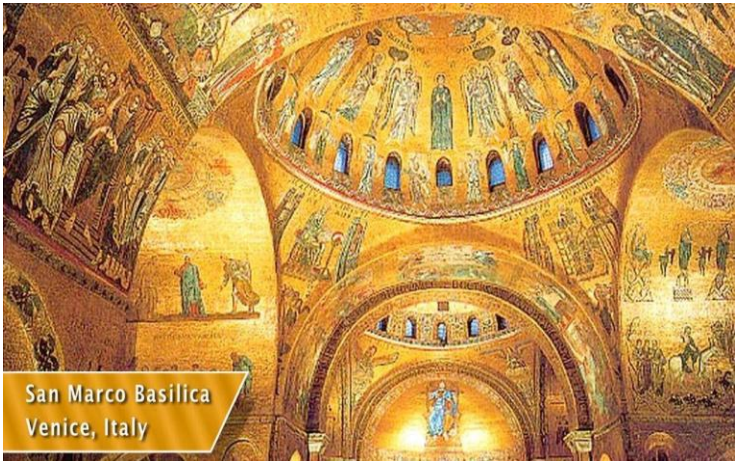
It may be confidently asserted that animals have no primordial need for power, unless is it tethered to the survival of the species, like an antelope becoming the dominant male in a herd, yet access to thousands of females would have no evolutionary value to them, much less a sense of mastery, power, or control. Because they cannot envision these superfluous possibilities, our mammalian cousins are, to say the least rooted in reality and have no aspirations for glory or any aspirations at all.

The Nietzschean notion of human nature as manifesting a will to power rather than a will to survive conflicts with the Darwinian notion of survival as paramount. Power is the ability to survey the scope of one's control. But its reach can far exceed its grasp, and when grasping what is available to you is all that is necessary to survive, power can be superfluous to survival, and if pursued exclusively, detrimental to it. This creates a conundrum. Does mankind have a will to power, a hypothetical end to behavior that fits into the teleological scheme, imposed somehow by evolution or divinity, or is it just a divergent property, a side effect of evolutionary processes that obtained ulterior goals? As we shall see, even evolution can be perverse.

The Spandrel of Power

In architectural terms, a spandrel is a triangular space which exists over the haunches of an arch. The evolutionary biologist Stephen Jay Gould noted that the spandrels of the San Marco cathedral, while quite beautiful, were not spaces planned by the architect, but were rather incidental to the necessities of design. Gould thus redefined 'spandrels' in the evolutionary biology context to mean any biological feature of an organism that arises as a necessary byproduct of other features selected for by evolution.[ii] Byproducts for good or ill are common attributes of the good, from pollution being byproducts from consuming energy for making things and going places and clean air being

a byproduct of solar energy, all attributes of products selected by man and nature that have multiple properties that may accentuate or impede their purposes. The concept of power makes value extensible beyond its immediate or even long-term value, as we would value the highest those achievements that would surpass even our lifetimes and echo into eternity, and even die trying to achieve them.



Spandrels of San Marco

Power underscores an appraisal of competence and does not necessarily assure survival but can be precursor to a fall. An inadvertent design flaw. The question being, if wanting is detrimental to the race, or how is it 'felt', then what is the source and purpose of those feelings? As we shall see, the answer underscores not only feeling but incentive motivation, learning, and the emergence of purpose itself.

Chapter 6

Teleology in Affect

Mentalism

As we have noted, modern science generally rejects teleology, explaining natural phenomena by final causes or purpose in favor of mechanistic, functional causes. Science focuses on *how* things happen through physical laws rather than *why* they happen and excludes goal-oriented explanations of natural processes. In addition, science also provides simple metaphoric ways to understand how complex mechanistic causes underlying reality influence how we perceive reality. For example, processes of disease, albeit complex, can be demonstrated as emergent properties of molecular microbial events that can be reduced to simple conceptual metaphors and taught to school children, who can take the lessons learned and immediately discount teleological causes for feeling ill, like demonic possession or bad air.

On the other hand, it is commonly held that neural processes of motivation are complex and diffusely spread across different brain regions and thus have no emergent properties that could be translated into conceptual metaphor. The result is that teleological causes for behavior, from good and evil to greed, love, and power, have conceptual validity as irreducible objects, and is why we study the history of philosophy,

but not the history of natural philosophy. Thus, we pay attention to Aristotle's political science but discard his thoughts on physical science.

Which brings us to the problem of mentalism. Mentalism is the position that insists on the reality of explicit mental phenomena, such as thinking and feeling. It holds that mental phenomena cannot be reduced to physical or physiological phenomena. This is logically true considering reductionism as a *process*, as there are no algorithmic processes that can reduce what we know and feel to actual molecular neurologic events. However, what mentalism also entails is that although motivating or purposeful properties of behavior can logically emerge from neurobiological or lower-level processes, they cannot *metaphorically* emerge from such processes, unlike other well-defined aspects of the human brain supporting memory, olfaction, locomotion, etc. that are readily demonstrated to emerge from simply conceived neural events. In other words, neural processes underscoring motivation are intractable to conceptual metaphor, and simple metaphorical motivational processes cannot be derived from the intractable workings of the human brain.

A problem with this position is that if thinking and feeling cannot metaphorically emerge from the undeniable physiological states that underly them, then various species of cognitive and emotional behavior from pride to prejudice become simply matters of inference. However, inferences are not proofs, and when different inferred principles are

matched against each other arguments tend to go past rather than to one another because each side will not accept the non-empirical claims of the other, as inferences by definition are grounded not on empirical facts, but merely logically related to other inferences, or in other words, are all syntax without underlying meaning, or semantics. To solve this problem, we will start with the most undefinable reality of them all that is somehow detached from reality, consciousness.

The Qualia of Life

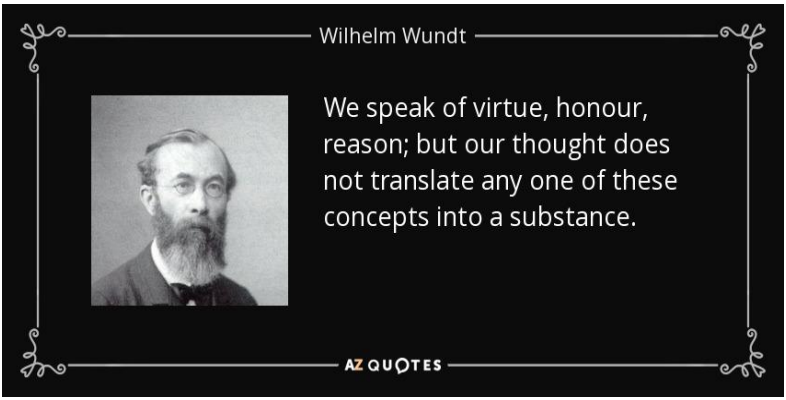
"From a biological perspective, it is eminently plausible that reason has grown out of the sensory and motor systems and that it still uses those systems or structures developed from them. This explains why we have the kinds of concepts we have and why our concepts have the properties they have. It explains why our spatial-relations concepts should be topological and orientational, and it explains why our system for structuring and reasoning about events of all kinds should have the structure of a motor control system."
Mark Johnson and George Lakoff

Consciousness may seem to be an outlier in our discussion of how motivation emerges from simple interactions between neurons, or the thinking stuff that gets us places and the affective stuff that tells us where to go and what to learn. What emerges from all of this is consciousness, or the 'hard problem' of existence. The fact that objects like the image of a mountain top emerging from sea of pixels have a distinct reality of their own defies explanation. Consciousness does not

add anything to the mental computations that gives it reality yet is a completely *different* thing, or a different reality. This ineffable quality is continually demonstrated by the *qualia* of existence, or its subjective aspect or feeling. Following the philosopher Daniel Dennett's functional definition of consciousness as being of practical or evolutionary value, qualia itself by nature must always be functional too and *do* something or be effective by being affective. But to start, we must first define the essentials of affect. Although we may not know what consciousness is, we can at least define its essential contents, and its subjective components can be defined if keenly and objectively observed. That was the opinion of the 19th century founder of experimental psychology, Wilhelm Wundt. Wundt rued the lack of empirical validation that gave wings to philosophers' fancies but not to scientists' facts. Nonetheless, human observation can dispel illusions if one addresses those observations with scientific rigor and looks to their essential components. So, what essential feelings populate our consciousness if one looks closely and defines precisely? Well, it certainly bears asking if the questions are bare and precise and the situations are simple. Rudimentary situations and accurate observations were the grist for Wundt's analysis, and not the observations, however perceptive and descriptive, of the introspection of individual philosophers. In addition to the inputs from the primary senses of sight, sound, smell, taste, and touch are how they integrate with cognition, resulting in

their affective inputs, or how they feel. These can be reduced to pain, pleasure and desire. Along with the primary senses, these affective states can be accurately measured, albeit subjectively. What was different for Wundt was that he dispensed with the metaphoric aspect of affect outside of its primary colors, whose admixture were as basic to the ever-changing pallet of affect as the colors red, green, and blue to the myriad colors of the world.

To do this, Wundt developed the procedure of controlled introspection. or 'internal perception', which was a highly controlled, experimental method designed to scientifically study conscious experience. Participants were trained to objectively observe and report their immediate sensations, feelings, and thoughts in response to repeated, standardized external stimuli such as variations in light and sound. Wundt's method was highly repeatable and thus subjected its results to correction for error. Participants were instructed to focus on immediate sensations, avoiding interpreting the stimulus based on prior knowledge. Wundt aimed to break down conscious experiences into basic elements, such as sensations and feelings. Experiments required high attention from subjects, controlled, repeatable stimuli, and precise timing, with the goal to understand the contents or structure of the mind, though not necessarily its function.



Wundt's resulting Tridimensional Theory of Feeling, often called the three-factor theory of emotion, proposes that all emotional experiences can be classified along three independent, bipolar dimensions.[iii] He determined that emotions are combinations of these basic "simple feelings". Thus, according to his data, any feeling can be mapped using these sets of opposites:

1) Pleasure vs. Displeasure (Valence): The most basic dimension, indicating how enjoyable or satisfying an experience is or how painful it can feel.

2) Excitement vs. Inhibition/Depression (Arousal): Measures the level of physical or mental activation and stimulation.

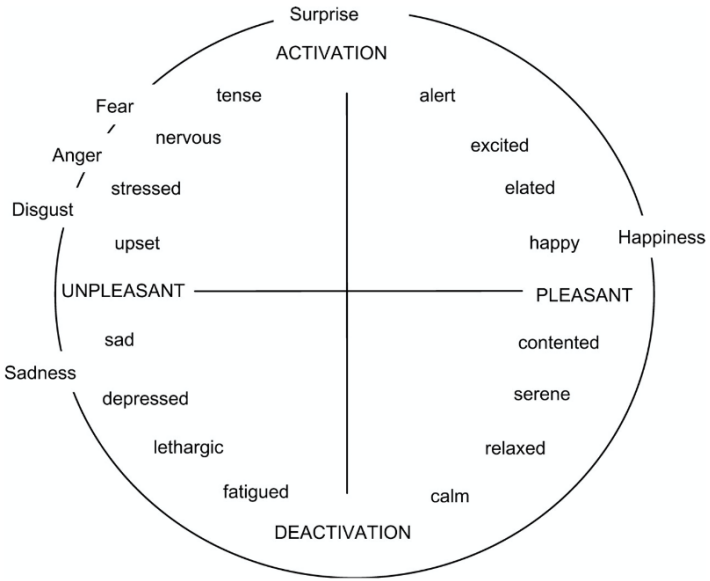
3) Tension vs. Relaxation: Refers to the degree of mental stress or physical effort involved in the feeling.

Objectively, Wundt's analysis was not a theory of emotion, save for his contention that emotion emerges from the admixture of distinctive affective inputs or 'feelings'. It makes no other assumptions and does not venture into conjecture as to the underlying neurologic

processes underscoring affect. Indeed, its very categorization as a theory may seem to render its empirical contents subject to doubt, as if they were aimed at satisfying theoretical aims of unknown purpose rather than as foundational for any accounting of feelings as the substrate of emotion. Rather, Wundt demonstrated that any theory of consciousness, for biologic creatures at least, must be 'embodied', or in other words imbued with continuous feeling that emanates from the senses of the body as an integrated whole.

Wundt's observations have not remained unremarked and were expanded a century later by the psychologist James Russell, who mapped the combinatorial influences of valence (pleasure-displeasure) and arousal (activation-deactivation) to an emotional circumplex.[iv] It suggests that all affective states arise from these two fundamental systems, arranging emotions like joy, tension, and sadness according to their similarity and intensity. Nonetheless, as with Wundt, Russell's model is descriptive and not theoretical in nature and does not make any testable conjectures as to the etiology or function of affect. However, from Wundt's work we can posit that consciousness, at least for biologic creatures is more than just computation, as calculation must have a 'feeling' to it, and that feeling has a function and therefore an emergent rather than imposed purpose. But what are the neurologic substrates of these objectified feelings and the nature of their emergent

purpose? To that end, and to justify Wundt and his successors, we can now look closer.



The Emotional Circumplex

The Atoms of Affect

Following Democritus, the atoms of existence serve as a primary metaphor for the mathematics of simple concepts, the conceptual building blocks from which one can erect castles in the sky. But the simple syntax of atoms in motion must semantically map to the observation of, well, actual atoms in motion. If not, then castles in the sky will remain the province of imagination. Fortunately, the atoms of affect do not need to be reduced to the near quantum realm, and to

understand the element of affect, simple neurons will do.

The primary neurologic sources of affect are not computational but analog in nature and are colored and enhanced by cognition as effected in neural nets in the brain that reciprocally influence the neurons in the midbrain that govern affect. Like the philosopher Descartes' postulation of consciousness as lensed through a little pineal gland in the midbrain merging united sensory input into a single conscious image, so too do small clusters of neurons in various areas of the midbrain, or 'hotspots', act as effective seats of affect, particularly for arousal and pleasure. Although the neo-cortex is innervated and has no receptors for pain or pleasure, its cellular arrays or neural nets provide through its axons or nerve fibers feed forward and backward loops from the cortex to the mid-brain that make for affective experience. Conforming to Wundt's findings, these experiences are also demarcated into species of arousal, pleasure, and pain.

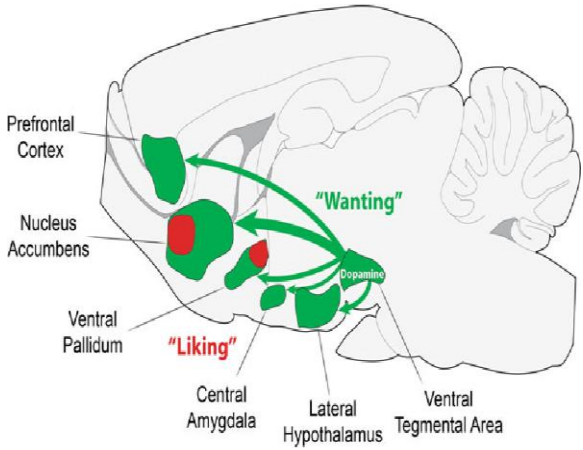
Attentive or alert arousal is dependent upon the neuromodulator dopamine that is released from clusters of neurons or 'nuclei' at various 'hotspots' in the midbrain. (A neuromodulator is different from a neurotransmitter as it modulates or activates clusters or arrays of neurons.) These nuclei abut opioid nuclei that are responsible for pleasure and the modulation of other neurotransmitters governing pain, mood, and reward. How these different dopaminergic and opioid neuromodulators are activated or suppressed through their mutual interaction and through their interface

with cortical structures, or cognition and results in the kaleidoscopic array of affect that comprises daily life, and as we shall note, are pivotal to learning and incentive motivation and for purpose itself.

Wanting and Liking

The utilitarian philosophers through their emphasis on pleasure or liking were countered by philosophers like Schopenhauer and Nietzsche who emphasized the primary impulses of arousal or wanting. But on closer analysis these were not antagonistic but complementary and synergistic impulses that are codependent upon each other. Indeed, both opioid (liking) and dopamine systems (wanting) can interact with each other, and each may accentuate or inhibit the other alternatively and in concert. For example, eating tasty food activates opioid nuclei, which activate dopamine systems in turn. Or in other words, when we like something that tastes good, we become more attentive to it and want it more. Likewise, dopamine systems can reciprocally activate opioid neurons, as pleasure is reportedly enhanced when one is anticipating novel and positive outcomes, such as when one finds food tastier when watching anticipating good news, and less palatable when prospective news is bad. A final observation, again confirming Wundt, is the fact that while opioid systems are intermittently or 'phasically' activated by food, drink, or other pleasures, covert somatic or neuro-muscular resting states can continually or

'tonically' elicit opioid activity or feel pleasant, and can also be enhanced or depressed by the anticipation of good or bad news when not otherwise disrupted by neuro-muscular tension or stress and its accompanying and inhibiting discomfort. This is often reported as peak or 'flow' experiences when moment to moment positive and novel 'touch and go' feedback occurs while performing creative tasks when relaxed.
As we have noted, the observation that emotions are composites of ever-changing colors of primary affect, like an artist's palette is the admixture of primary colors of red, green, and blue, constitute 'circumplex' theories of emotion or affect. Primary affect in turn can be reduced to the interactive neural feedback and feedforward loops between cortical or 'thinking' structures in the brain and more diminutive groups of neurons governing affect that for all their import are no larger than the eraser on a pencil.



Wanting and Liking

Though the observations follow Wundt's descriptive model for behavior, what these feelings actually do are another matter entirely, and it is here that they and the neural systems that inform them control not just for feelings and emotion, but for motivation and learning as well.

A Matter of Stoplights

'Live and learn' is a well-worn motto of life, but the emotional qualia of living are not separate from but are intertwined with learning, a process that is also determined by the neuronal events that govern affect. To understand this, you must first understand what you have to go through at birth. Being born is a chaotic experience to say the least. A newborn must sort out the world quickly, and if not, can wind up quite dead. That's the selectionist principle at its more basic, as survival mandates and selects for brains with the neural chops to know what to pay attention to and fast. As or more important to what should pay attention to is what you should ignore, and the litmus test for this is quite simple, namely predictability, as known facts are not forgettable facts, they just do not merit much attention, if at all.

Reduced to its essence, life is simply a matter of stop and go. Traveling on the road of life, or just a road, means following the prompts, and motivation is just a matter of arranging them just so. Consider the simple matter of knowing what to do when you see a stoplight. Red means stop, green means go, and yellow

means go very fast. You get the idea, in fact all of us do. So, learning traffic lights is a snap, just like learning all the stop and go lessons in life.

Except when it's not.

Consider a blue light, blinking on and off in tandem with the red light, and signaling also the need to stop. Although the blue light reliably signals information, that information is redundant, and a person will ignore it. This represents Kamin's blocking rule, that a reward that is fully predicted does not contribute to learning. A stimulus that can be entirely predicted contains no new information, and the reward prediction error rate is therefore zero. The psychologists Rescorla and Wagner described the so-called Rescorla-Wagner learning principle[v], which states that learning slows progressively as the reinforcer becomes more predicted. In other words, we won't learn new associations, however reliable they may be, when they predict nothing new. Nonetheless, we rely upon the tried and true, or what we have learned, and like a nonconscious skill, we use what is learned to always learn something else, something different, and bring our knowledge to awareness when our predictions go astray, as they invariably do.

Discrepancy Theory

When we look around ourselves, we are not truly 'observing', we are instead dreaming an image of the world based on what we know and unconsciously scrutinizing the world to reveal any discrepancies, which, if necessary, we will try to correct. What I see, in other words, is not a reproduction of the external world, it is what I expect, corrected by what I can grasp. The relevant input is not which confirms what we already know, but that which contradicts expectations. Carlo Rovelli

To learn is to be motivated, as we must constantly calibrate our behavior from moment to moment to navigate an unpredictable world. This calibration or error correcting to match predictions with an ever-changing reality is core to the neurologic science of purpose, incentive motivation, or reinforcement. The resulting 'discrepancy theory' of reinforcement or reward has no sole author but has emerged from several academic sources from John Donahoe and David Palmer,[vi] Wolfram Schulz, Kent Berridge[vii], and others who used the resolving lens of modern neuroscience tools to observe from a neuronal or cellular level how motivation worked in laboratory animals, such as mice. Their generalization from mice to men is confirmed by the very structure of mammalian brains, generally unaltered by evolution save for the much larger neocortex of humans,

Instead of viewing reinforcement as a mechanical process, discrepancy theory posits that an event only

acts as a reinforcer if it is *surprising*. When an unexpected reward is perceived using higher brain or cortical areas, this feeds forward to dopamine neurons that spike or increase firing, providing feedback to the neo-cortex and changing or modulating arrays of neurons in the cortex, resulting in learning. This feedback and feedforward system in its rudiments show how organisms learn and are motivated to learn, as dopamine not only modifies learning, but also how it feels or its affective value of behavior in the moment, or 'decision utility'. As a rule, positive discrepancy, or receiving a more positive outcome than expected strengthens behavior, whereas negative discrepancy, or receiving as less positive outcome than expected. In addition, the brain can even track these discrepancies when watching others learn, facilitating social learning and teaching. The dopamine system codes not just moment to moment outcome evaluation but also reward anticipation. which refers to dopaminergic activation while considering a reward in the future. Anticipated reward may be a future stimulus event such as food or drink, or it may represent the branching positive and novel implications of a reward, such as those signaled by an award or a monetary gain. This can motivate a fisherman to stand idly by his fishing rod for hours at a time, or an artist to labor for hours on end to complete a work while he carries an image of triumph in his mind. In addition, dopamine activity will scale with the importance of the reward. For food and drink, this is a function of deprivation leading to hunger or thirst, or it may scale with the

number and significance of the branching novel and positive attributes of a goal. Finally, affective events commonly over or under match the logical value or utility of present and predicted events, with the bill coming due in behavior that can be functional but also dysfunctional for the individual and often for society at large. This can represent the largesse of expected utility, or an unexpected utility bill.

The Utility Bill

Eat a potato chip, and not only will it be tasty, but it will also elicit your attention. Neurologically, eating tasty food activates opioid systems, or feels pleasurable, but pleasure also activated dopamine systems as well, making the food more desirable than before it was consumed. This, as any dieter will know, is not good for one's self-control, as the value or decision utility of the behavior in the moment, namely snacking, is inconsistent with its predicted utility, namely its nutritive and caloric value.

Consider also a gambler at a slot machine. The momentary value of a win is unexpected and positive and also activates dopamine release that increases the momentary value of the behavior that again is in contrast to the predicted of expected value of a night at the casino, namely an almost certain loss.

Now consider a recent college graduate who foresees a massive payout for his long-term effort, to be a titan of industry, amass a fortune, and become world famous. Aspirations do impel, and this Nietzschean 'will to

power' is core the many high anticipations, or 'hopes and dreams', that propel achievement.

There is of course method in nature's madness, and the self-destructive impulse in motivation, although arguably a byproduct or spandrel of evolution, entices mankind to ever venture to new heights, even though it is rarely required for survival and more commonly causes their individual demise. And most critically, it is an affective justification for selfishness, greed, and despotic power, as the continuous feeling in the moment guides vengeful, hateful, and inconsiderate behavior that overshoots the logic of their consequences, or of evil continually manifest in an otherwise logical world. And on the other hand, it can account for virtuous or self-less behavior when good deeds make for good feelings, underscoring and underestimating their logical gain.

This is a recipe for chaos, despite its silver lining of virtue. But consider the alternative. In a perfect world, and if people were perfect machines, then decision utility will always conform to its long term or predicted results of utility or matching short term with long term goods. Moment to moment achievement would be modest, assure survival, but never aspire to anything more. There would be no evil, but no virtue either. It would be a society as an ant hill, where everyone knows their place and is satisfied with their lot, which merits survival, and nothing more. These are the qualities of Nietzsche's 'Last Man', his critical archetype for the modern, complacent individual who seeks only comfort, entertainment, and security over

struggle and greatness. Nietzsche's fear was that society would address safety over struggle, certainty over doubt, and serenity over passion, a prescription for a logical way forward but not the *wayward* logic that is required not just for accomplishment, but for sanity, remedied as we will see by a simple seeking feeling.

A Seeking System

"The anticipatory eagerness aroused by the seeking system is more future-opportunity oriented than the sensory effects. It is ready to capitalize on all the environmental resources needed for survival. In that general role, it was 'designed' through evolution to be the most general-purpose emotional system in the brain. It integrates what organisms must do to survive, Jaak Panksepp

Place a tiger in a confined space, and no matter how much it is physically pampered and cared for, it would soon go mad. Better for it would be to recognize the importance of hidden geometries of space that it would need to explore to keep attentive, aroused, and alive. This is no different for humans as well, as was the moral of an episode of the anthology television series 'The Twilight Zone', where a burglar dies and goes to his presumed heaven, where he has everything he wants, all predictable of course, when later the agony of boredom causes him to implore his guardian angel that he was tired of heaven and would rather the other place, to which the angel replied with a bellowing laugh that he *was* in the other place.

Humans remain animals, fortunately and unfortunately, and rising above our circumstances is not in the cards, it's in the genes. And it all starts with the necessity of survival that depends on being able to continually refine one's prediction of the world. Survival, in other words, depends upon a seeking system, an inherent sensitivity to render the uncertain certain in service of the elements of survival, from a mate, to food, to survival from nature itself. Reward means for an animal an ever-ongoing transition from the unpredictable to the predictable. When that stops, the organism loses means for existence, and with it its purpose.

The myriad attributes of behavior, from our rational purposes to the affect that drives them, are emergent forms of this essential instinct. The act of wanting and the emergent 'wants' that populate our lives represent simply the cognitive geometry of 'seeking', the evolved chemistries in mind and body, that actuate behavior and ensure survival. Wanting is a survival mechanism, but not an efficient one, as it often mismatches what 'is' with what 'ought'. And it is because of personal inefficiency that we often fall below our potential with ineptitude, cravenness, and malice, but also can rise above and even spite nature with the cultivation of beauty, courage, and care and deny or affirm the foresight of the blind watchmaker of evolution which made a behavioral clock work that could not precisely tell time. Overall, survival isn't second nature to us, it *is* our nature, and is the

intertwined function and feeling of life, and its emergent purpose.

Value

Value is the handmaiden of purpose, the beacon that drives us forward or away. It is in short, the 'deciding' factor, or what makes you decide in the moment of the direction to take, whether that is to pause at the keyboard, entertain a new thought, or bolt away to a chair in a veranda to look at the birds. It is determined in the moment by a web of relationships both immediate and future that are guided by circumstance, thinking, and memory. It is unpredictable in the small and predictable in the large, like minute quantum dots falling in line to the larger force of gravity. In this case it is affect or 'feelings.' The immediate effect of this immediate affect has utility for creatures large and small. This 'decision' utility marks the moment to moment change in behavior due to affective value and may in the large be considered as value itself. Decision utility refers to the decision in the moment that is determined by the future result of that decision intertwined with the affective result or 'feeling' of that decision. As per our earlier description, this feed forward and feed backward loop between the cognitive and affective areas of the brain determines what we value in the moment and across moments and has distinctive attributes that underscore all value.

Value is Granular Moment to moment resolution of expectancies or in the anticipation of such resolutions.
Value is Novel Value increases with positive and novel moment to moment changes in the perceived present and future that resolves the unpredictable to the predictable.
Value is Affective Value is coded not just rationally, but is integrated with affect, or as a guiding 'feeling' that is apart from pleasure.
Value is Relational Value is dependent upon the revised and novel order of concurrent and multiple acts and outcomes, both realistically and virtually perceived.
Value is Extensible Affective value scales with the novel and positive present and future implications of behavior, or from the here and now to 'hopes and dreams'.
Value is Virtual Value is virtual, or a anticipated cognitive relationship and provides the same rewarding stimulation as a precursor to action, even if action is never practically achieved.

Value derives from abstract rather than the normative properties of existence. In other words, it is not what you are achieving but how you are achieving it that is important, and the certainty of conquering even the universe has no import if it all settled on a coin flip. Value also scales with the intensity and prolongation of positive affect, and for this it is the journey that counts, and in this regard, even running on a treadmill can be glorious.

The Satisfaction Treadmill

Consider a simple treadmill, but this one with a unique feedback mechanism. Here, the machine will not only record your speed, finesse, and endurance, but will give you feedback from others who will affirm, approve, or 'like' what you are doing. The better you perform, the more numerous and emphatic the positive feedback. Very little of the positive feedback you receive can be translated into a physical good, from gifts to personal attention, with the remainder being denominated in the virtual and non-transferable goods of positive regard. And of course, if the treadmill slows or stops, you would be left with no more worlds to conquer, a lament that is as old as Alexander the Great. Which brings to another treadmill, topologically similar to our mechanical device, but this time spread across the European continent.

You are Napoleon Bonaparte, and your career spans two decades from the 18th to 19th centuries, and you move with speed, finesse, and endurance with an army or two in tow. You subdue nearly the whole of Europe, which showers you with goods and positive regard. Still, you are able to partake of only the smallest portion of your largess, the remainder remaining of virtual value alone. Unlike Alexander, you will not have time to weep for their being no new worlds to conquer, as they will conquer you instead, with your own satisfaction treadmill coming to a stop on the fields of Waterloo.

Napoleon's motivation is not any different from the motivations of other humans who are as passionate in their own domains, save for the size of his own personal treadmill that ground down nations and armies. But the topology of the situation, or form is what counts, and Napoleon could have achieved similar conquests and the same satisfactions, if in the words of the historian Will Durant, he just stayed in a garret and wrote four books.

The 'satisfaction' or 'hedonic' treadmill is a misnomer, as what motivates all on the treadmill of life is not pleasure but the unquenchable and non-pleasurable 'wanting' that Schopenhauer so acutely perceived, and which underscores the will to power that Nietzsche proposed as the heightening and prolongation of desire. Pleasure isn't the point, but arousal is, and as an addict is driven by the artificial scaling of dopamine release to an unnatural high, we are similarly driven to a natural high when accomplishment is not just average, but extraordinary, and vaults us from simple achievement to encompassing power. But although extraordinary accomplishment may echo into eternity, survival is for the here and now, and the practicality of evolution is routinely overridden by impractical goals that may not only contribute nothing to but may also impede one's very survival.

Chapter 9

Virtuous Worlds

"The nature of man is not his internal structure but the network of personal, familial, and social interactions in which he exists. It is these the 'make' us, that guard us. As humans, we are that which others know of us, that which we know of ourselves, and that which others know of our knowledge. We are complex nodes in a rich web of information." Carlo Rovelli

A World without Wanting

Since paleolithic times, the labors of mankind have been progressively transitioning from the debilitating, tedious and meaningless to those that are ever safer, more interesting, and meaningful, to a point. In short, the relations between the elements of our world have multiplied in number, richness, and permanence. These relations remain transitory and generally positive, even given the slings and arrows of outrageous fortune. From family and friends to our control over our personal, social, and physical environments, we all have this societal interest. What is missing and rare is the passion in life that makes its own values while breaking natures rules as if by nature's design.

The future augers a bounteous world where every need is fulfilled, but when want is eliminated, so is

wanting. Everything becomes predictable, save for running in circles like in a hamster's turnstile, with much ado about nothing. To that we must capture again lightning in a bottle, and return to Schopenhauer's remedy, and Nietzsche's too. But this time the key is making reality not real, but virtual, and requiring not machine or digital tools, but the simple tools enabling and unleashing the creative mind, from the pen to the palette to the music of a soprano's voice and allow it to pursue any purpose and define any beauty by fostering all and mandating none.

This passion is embodied in Nietzsche's will to power, a universal and hidden human trait that represents the magnitude of arousal hinged to the magnitude of purpose, or of the positive branching positive opportunities of the future. Naturally, this breaks the boundaries not only of survival but of meaning, as values now may be determined in part by the illogic of affect.

The Will to Power

Power is not just being interested in but in being passionate about mastering one's chosen domain. It is a state of high and continuous attentive arousal focusing on one end. Indeed, this can succeed independently of intellect, as in Isaac Newton's famous reply when asked how he discovered the law of universal gravitation: *"By thinking about it all the time."* This level of relentless, obsessive focus defined his approach to science and mathematics, not just

breaking the rules but making the rules, the epitome of the will to power.

Power is agnostic to the domain of what can be accomplished and is measured by high and persistent arousal to secure the mastery of *any* accomplishment. The issue though is not that this 'will' is commonly inhibited or suppressed, but rather that it is not aroused, and the latter is product of a society that calculates and imposes demand, but only to sustain the workaday 'knitting', or perhaps in autocracies and misgovernance, not at all. Neglect can be as detrimental to motivation as suppression, and countless artists have been damned not by the pyre, but by faint praise. Societal neglect results in Nietzsche's derogatory 'herd' or 'slave' mentality, when societal institutions by their activity or passivity push individuals to dilute their uniqueness and become interchangeable parts of the collective. So how do you combat against this? Well, sometimes you have to start with chasing them out of the house.

Agoraphobia

It starts with power failures, or turning the lights off, or better, not having any lights at all. And if the populace of the town is living in cramped apartments without power or other amenities, their residences become not homes but waystations to escape to a better place. And the better place could be within walking distance and would serve all purposes and create infinitely more. It would be a place for artisans and merchants, farmer's markets and social entertainment,

and for a few, a source of ideas, debate, and ever flourishing passion and purpose. This is not of course a prescription for life in the modern world, but it was just the ticket for the ancient one, and without this unwitting incubator or ideas, our modern world would scarcely exist. This was the agora that was the center of nearly every Greek polis or city state during the age of classical Greece.

The agora was extremely common and central to ancient Greek life, with nearly every city-state (polis) in the more than twelve hundred that comprised the Greek world having one by the classical period (ca. 600 B.C.) as the heart of public, commercial, and social life. Usually located in the city center or near a harbor, it functioned as the primary marketplace, political assembly area, and social hub. The agora had a social purpose, but not a doctrinal one in a political or religious sense. In other words, it had no purpose, on purpose. Ancient Greek life had no teleology or set purpose set by man or the gods, and purpose could only be freely determined without the influence of unpredictable gods vying with uncertain atoms for the fate of the world. The gods themselves were libertarian, more concerned with each other's petty jealousies than their human charge. They could be called upon like a concierge, and paid for in sacrifice, temples and a prayerful nod or two. Though superior in power, they were not superior to mankind in intellect, but merely let them be, and even denying them met with no heavenly reprobation, given of course an earthquake or two.

The School of Athens

Greek society was no idyll, and for all its freedoms and stimulation for the intellect, the Greek world was decidedly unfree. For example, the Athenian state had a population of about 300,000, the same as in Pittsburgh, Pennsylvania. But of this number only 40,000 or so were citizens and had the right to vote, the remainder from woman to slaves to resident aliens were uneducated and disenfranchised. And yet this was the same society that birthed the philosophy of Plato and Aristotle, the plays of Sophocles and Euripides, the architecture of Ictinus and Callicrates, who designed the Parthenon, the sculpture of Phidias,

and on a neighboring isle, the science of Democritus. Can any American city with unparalleled freedoms match such accomplishment in such a short window of time? Unless of course, as we shall later argue, these same icons are alive in Pittsburgh now but are under different names but very different motivation.

The agora of Athens shows us that in terms of the sheer productivity of providing the means of existence, or gross domestic product or GDP, accomplishment has a adequate metric of sorts, and the physical lifestyle and longevity of the typical Athenian was likely no different than a resident of the Persian capital of Persepolis or nascent Rome. But do any other cities of the time possess the same romantic and intellectual allure? And if returning to the present, if the GDP of the average Frenchman equals the productivity of the average person in the state of Mississippi, can value actually be denominated in terms of material goods alone? When comparing one's preference to walk through the streets of Paris or those of Jackson, Mississippi, is value determined merely by personal wealth, or can value be denominated differently? For sustaining positive affect or 'happiness' gross domestic value is arguably a better metric, but a virtual one, and resists the economists empiric measure, but in the end what only matters is virtual demand and reward that comes bountifully and in every form.

A Matter of Demand

Sometimes societies have a simple quality that unexpectedly vaults them to renaissance, an incubator of sorts that produces lots of ideas, some of which echo into eternity. The spark of passion and creativity remains nothing less than demand, and Greek science, art, philosophy, and playwriting came from demand that permeated all levels of society from the commoners to the governing elite. However, demand does not occur in an environmental vacuum nor from a human nature unchallenged and narrowly stimulated. It was the individual spark of boundless opportunity that was buffered and channeled by the competition of countless other minds, and the shattered politics of the polis provided for this, as the Greek miracle was but a spandrel to political and social diversity that encouraged novel purpose everywhere. Still, the Greek experiment was brief, and when the polis was subsumed under Macedonian and later Roman domination, creativity fell away like autumn leaves. Sadly, when viewing the entirety of the human world apart from the Greek microcosm, the flowering of the human intellect and novel purpose is as commonplace a feature in the history of mankind as a personal rose garden in the Amazon basin. It is a jungle out there, and rebirths are as valued for their rarity as their accomplishment, and we are astonished by the creation of common people charged with uncommon purpose and passion. But what happens when the

jungle is tamed, and survival needs become a lesser subject matter?

Monoculture

Raising chickens is easy, just provide them with the same diet, the same cages, and the same lifespan from birth to slaughter. And in the meantime, being a chicken has its bare pleasures that keeps its heart beating and its mind racing, to a point. Nature provides for the impulses for survival, yet these same benign and banal virtues can be vaulted to higher purposes if cultivated to a special intensity and madness. But for now, as then, there is no time, save for a few, who ironically, make time for all.

Mankind became fruitful and multiplied when it harvested one fruit and remained fixed in one social and physical place. The multiplicity of game and grains in the paleolithic age was replaced by harvests of singular beasts and crops, and agriculture became monoculture. Human culture followed with similar rules, customs, and gods that fixed humans physically and psychologically in one place. Mankind, as it would seem, requires very little of nature, as mammals go, and very little mentally, or so it seems. And so, the standardization of the mores and folkways of life followed the standardization of the very sustenance of life, except for human emotions, which break the logic of existence. The will to power, while the masses of humanity had no time for it, the ruling class did, and they ensured their place by enabling the masses to visualize a better place by creating monuments in

stone, marble, literature, and music. From the pyramid of Cheops to the palace of Versailles, the common people could take note and dream of beauty and majesty and continue to do so today. Yet would one want to merely view the Mona Lisa or paint the Mona Lisa, to listen to a Mozart symphony or compose one? The difference is between value made by others or value made by yourself, the latter embodied not by momentary interest but by consuming passion. And the solution? It's simpler than you think, and just requires an audience.

Sound and Fury

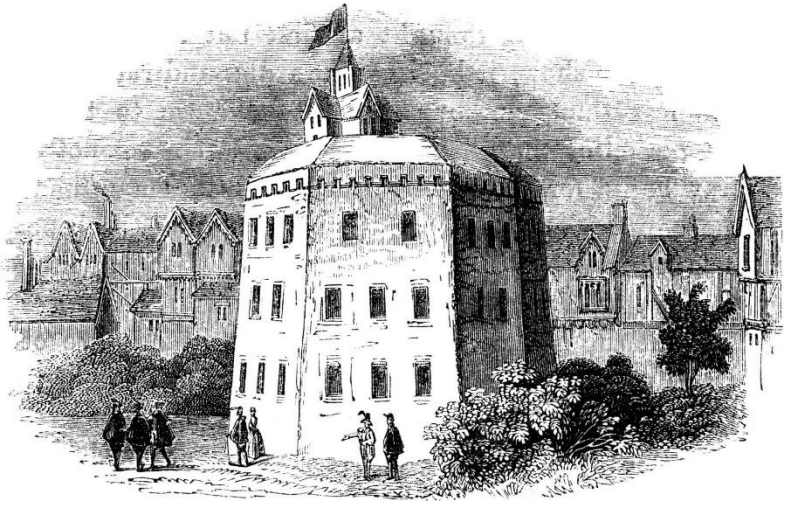
Life's but a walking shadow, a poor player, that struts and frets his hour upon the stage, and then is heard no more. It is a tale told by an idiot, full of sound and fury, signifying nothing. Macbeth (Act 5, Scene 5).

Consider this example of a poor player, or at least how he started out. Short on funds, but with a classical education at least and a literate ear, he found a new way of living that played up to his talents, namely the play. Living in a 16th century squalid middling size city amidst a bored, superstitious and barely literate populace, and a ruling class jealous of its prerequisites but amused by irony. Perfect kindling for crackling entertainment, which he and his business partners thought to create at their own financial risk. And so launched the career of a certain William Shakespeare.

It is often thought that genius germinates in isolate, and that intrinsic interest is enough in itself, but

interest only vaults to passion when someone pays interest or better, pays the bills. The Academy of Athens, the Renaissance in Italy, and the blossoming of portraiture in 17th century Holland, of music in 18th century Germany and Italy, and of poetry in Edwardian England occurred because of audiences who would listen, approve, and ultimately pay for the pleasures of creation, William Shakepeare's London was no different.

But to truly understand Shakespeare's motivation, it is important to know the cultural milieu that gave his inspiration flight. They play's the thing, but was a novel thing in Elizabethan England, and the construction of playhouses in London, among them the Rose and Shakespeare's the Globe, was akin in Elizabethan times to the creation of a mass media, even though the audience was in a dilapidated city the size of an average American midwestern town. There were ten to eleven theaters operating in London at the time, and with an idle populace creating demand for entertainment, supply was commensurate. As the historian Daniel Boorstin recounts, *"In two weeks during the 1596 season a Londoner could have seen eleven performances of ten different plays at one playhouse, and on no day would he have had to see a repeat performance of the day before…Playwriting had quickly become a growth industry and a profession. Of the twelve hundred plays offered in London theaters in the half century after 1590, some nine hundred were the work of about fifty professional playwrights."*



The Globe Theater

Into this creative milieu entered Shakespeare, who not only had a part ownership of the Globe theatre, but acted in and of course wrote many of the plays. Shakespeare's accomplishment was as calculating as it was creative, creating entertainment that appealed to every class, taste, and temperament, from the nobility to the commoner, to the pensive and chaste to the merely lustful. Poetry could serve any impulse, any class, and illuminate any fantasy. Of course, in the long term it all meant nothing as Shakespeare knew when he and his company of actors strutted upon the stage, and it is uncertain whether he had an eye to a greater posterity than local acclamation and a regular paycheck. Still, although in the grand scheme of time life means nothing, but in the meantime!

For Shakespeare, his productivity wasn't due to piecemeal or piece work incentives, it was for a piece of the action, and when that action ended when the Globe burned down, so did his career, as he retired soon thereafter. And as for the career of the typical English playwright, that too soon metaphorically burned down when in succeeding years recurring plagues, religious proscriptions, state censorship, and civil war soon ended the English stage, as plays could not after all be written in the fallow soil of monasteries. And so, the world and its minions returned, as it perhaps never left, to the more necessary task of making things rather than making things up, and for similar creeds to match similar lifestyles a monocultural world that serves basic wants. Until of course, when 'wants' begin to dissolve.

A World Without Want

As history attests, even among the learned, a critical consensus only changes when newer generations accept the newly revealed truths that earlier traditions ignored or denied. Such was the case with the adoption of the novel conception of an orbiting earth, the medical practice of antisepsis, the Darwinian principle of natural selection, and even challenging in quantum physics the Einsteinian notion that God does not play dice with the universe. But hastening these changes are when the need arises and moves to a breaking point, when only major change can resolve the disparities and crises of the world.

For modern science, the biological and physical revolutions ushered in a new world order where new paradigms of existence replaced the old and allowed for the elimination of physical want, when all can secure physical sustenance, but not unfortunately of the psychological kind. And to that end modern technology has created again a new monoculture that has only worsened the ennui of the times, and in time cannot stand. The new monoculture of the internet and the advent of artificial intelligence augers that our day-to-day lives are being progressively made virtual, but at least at first we played a part in it, as it was a medium between actual living minds. Now, each mind is being replaced by agents that emulate and reflect our own likes, causing us to be literally the odd man (or woman) out. And when you are cast out of the conversation, your only choice is to initiate your own, and this time, for real.

Demand by Design

From the agricultural and industrial monoculture of our ancestors to the technological monoculture of the present, life remains tough and precarious, and the humanities can wait while we learn survivable skills. However, in the future, when all wants are automated and intelligent discourse is at a premium, the humanities *will be* our survival skills. This will require a recalibration of our educational institutions to make us, at the very least, much more interesting. Then we are no longer forced to be monotonous, but can

cultivate not just our reasoning, but our passions. And to get there? A simple matter of social engineering not from the school of hard knocks, but from the school of Athens.

Engineered societies are nothing new, we see that in the lay of the land, of the city streets, utilities, hospitals, and markets, and every edifice rises up from the collective effort of education minds. To that end, education has remained simple in technique and solitary in purpose. At present education in its rudiments is for the prescription of value and the establishment of singular purpose. From private to public schools, all think the same and value the same things. Society as clockwork, not timeless, but just marking time. It makes for efficiency, less for creativity, but in static worlds they reliably ensure survival and a divergent thought need not matter.

A radical prescription is needed that restores trust in the independent human mind. Thus, schools should be for the diversification of value and for the elimination of purpose. Nothing is preordained, nothing is foretold, all that is to be encouraged is curiosity and striving in a web of personal relationships that are as changeable as quicksilver, and media that range from the stage to a musicians beat. Start from a common currency of knowledge, from history to philosophy, and with the knowledge of where all things come from and how they can emerge from this fertile soil to provide an acuity of vision and metaphorical visualization of how the large can emerge from the small.

Misery, it is often said, needs company, a better maxim is that one is miserable without company, and virtual accolades will not help, particularly if they are more and more likely to be generated by a machine, whether in non-player characters (NPC's) or by a chatbot with character. The key is to design the personal relationships that give flesh to the virtual, real to the unreal, and when sustenance is automated to eliminate want, to learn to use the endless time on your hands to just want. Power is the passion of energized wanting, and we don't want to watch the game, but be in the game, not marvel at a sculpture, but carve it yourself, not listen to a great poem, but write it to declaim in a public square. And all in reality, not virtual reality, as only the former can reward you with real laurels or prod you on with a swift kick. The democratization rather than monopolization of power is not in the possessions or the pleasures, but in the passion, which can be equally shared and also be boundlessly provided. It is a world of men and women who are superior to their ancestors as they now can create their own values with their own unique passions.

A World of Supermen

What was life like on the planet Krypton? One can only imagine on such an imaginary world. Certainly, it was filled with an ambitious lot, and power had its same grip on the imagination and machinations of men. Indeed, if one became a pain and pressed up too hard on the boundaries of power, one would be literally

locked up *in* a pane and shot off into space. Still, if mankind is relieved of making things, humanity has only recourse to a world where it must make things up. To that we may see the virtual ambitions stimulated and emulated by everyone. It will test the boundaries of value but will always be recharged and sustained by uncertainty. Following Schopenhauer, it will be focused on the creation and appreciation of beauty, and of the competitive and energizing striving for excellence on our own terms. The impersistence of memory requires the continuous refresh of beauty, as do all of our tastes from the tactile to the visual to the aural. From music to poetry, it does not discard a realistic and scientific estimate of the world that is always ready in experience and memory. Art is renewable, constantly discoverable, whereas science is fixed, and the end of science is eternally countered by the renewing apotheosis of beauty. And in service of these goals, the future remains Nietzsche's ideal, with the will to power, or obsessive accomplishment that is incubated by the hothouse of inspiration from a captive world insulated from harm by different yet hidden intelligence of our own devise that will share our values. To that end it is all ordained, a human and superhuman emergence from a jostling sea of atoms, foretold by the simple idea of an ancient philosopher whose books were burned.

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Coda

Notes from the Underground

Compared to social scientists who rarely look down, physical scientists or physicists are bottom feeders and start from the essentials and work their way up. Emergence is their byword, at they deal with mathematics, which only works in one direction and spans all dimensions, not just in ciphers but also in metaphor. Such is the result of the rejection by science of teleology, or of purposes that are untethered to actual causes. Invariably, causes emerge from the depths, which are easier to manage mathematically and metaphorically and allow us to build castles in the sky from the simple geometric relationships in nature. Inspiration comes from unexpected places, and for this author, physics is at the bottom of it, and so is the inspiration for this work. Science books are doggedly non teleologic, and focus on the how rather than the why, and when beauty and purpose emerges, it is a happy byproduct, a spandrel, like the colors of the rainbow or the luminosity of a star. And purpose is part of it, but as an emergent property of a beckoning universe that winks and smiles at us like the cheshire cat before dissolving into nothingness, only to return when least expected.

So, what is purpose after all? No one knows, and that is the charm of existence. Democritus knew this, and laughed at the ironies of nature, and so does the physicist Carlo Rovelli, whose admiration and

spotlight on Democritus this author stole, and in his own poetic books on the nature of reality, looked at the world from the bottom up and the beauties emerging from infinite atoms jostling in space.

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